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Dairy

OUTLOOK & SITUATION

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The present forecasts will be updated if needed in the the World Agricultural Supply and Demand Estimates scheduled for release on October 13, October 25, November 14, and December 13, 1983.

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Summary

USDA announced on August 2 that the support price of manufacturing-grade milk will be $13.10 per cwt for the 1983/84 marketing year (October 1, 1983, through September 30, 1984), and that an additional 50 cents per cwt will be deducted from the proceeds of sale of all milk marketed commercially from September 1, 1983, through September 30, 1984. Producers who reduce milk sales by 8.4 percent below their marketing base (the average of sales during marketing years 1980/81 and 1981/82) may claim a refund of the second 50-cent deduction.

Milk production during June-August was up 2.1 percent from a year earlier; August marked the 52nd consecutive month of year-to-year increases. The continued gains this summer were the result of additional cows and greater output per cow than a year ago.

Although cow numbers showed month-to-month declines during April and May, they gained in June, July, and August. The national herd is expected to decrease this fall as lower returns for milk, higher feed costs, and better off-farm employment opportunities cause dairy farmers to cull more intensively. On average, cow numbers will likely be up slightly from 1983, but they may be down 2 to 2.5 percent in 1984.

After slowing this spring, estimated gains in output per cow began to accelerate again this summer. June showed only a 1.2-percent increase over a year earlier. However, in July the rate inched up to 1.6 percent, and in August it registered 1.7 percent. Despite high concentrate costs, year-to-year gains are expected to continue through 1984, because of very high culling rates, better management, and genetic improvement. For 1983, output per cow is likely to be up about 1.5 percent from 1982's record 12,316 pounds. For 1984, an increase of 2 to 3 percent is projected, because feed costs are expected to decline by midyear and also because the extra day in leap year will add 35 pounds to annual output per animal.

On balance, gains in total milk production will likely slow late this year, given the expected decline in cow numbers. Production for the year will probably be up 1.5 to 2 percent from 1982's record 135.8 billion pounds. With gains in output per cow nearly balancing the decline in average cow numbers, production in 1984 is projected to be down slightly.

The all-milk price received by farmers during August averaged $13.30 per cwt, even with a year earlier. For the first 8 months of this year, the price averaged $13.46, 3 cents lower than last year. However, when the price is adjusted for the 50-cent deduction that started April 16, the effective return per cwt during January-August is down 31 cents (2.3 percent) from a year earlier. The price will likely recover seasonally—by 50 to 70 cents by December. With supplies ample, this year's average price probably will not change much from 1982. The average all-milk price in 1984 is expected to increase 10 to 80 cents, given the current law and its requirement of a higher support price on October 1, 1984. However, the deductions will lower the effective returns to farmers.

Retail dairy prices are reflecting overabundant supplies. The Bureau of Labor Statistics' retail price index for all dairy products stood at 249.8 (1967=100) in July, up 0.9 percent from a year earlier, while the index for all food was up 1.2 percent. For the year, retail dairy prices are likely to show a gain of 1.5 percent, compared with 2 to 4 percent for all food prices. In 1984, retail dairy prices are projected to be up 2 to 4 percent, while all food will be up 4 to 7 percent.

First-half commercial disappearance of all milk and dairy products, on a milk-equivalent, fat-solids basis, was down almost 2 percent from a year earlier. Sales are expected to return to the year-earlier level during the second half, leaving yearly disappearance down about 1 percent from 1982. The weakness of sales may be partly due to the large USDA donation of dairy products. Sales in 1984 are expected to be unchanged to up 2 percent.

With milk production higher and commercial disappearance lower in 1983 than last year, purchases by the Commodity Credit Corporation are expected to total between 16 and 18 billion pounds (milk-equivalent), compared with 1982's 14.3 billion. January-August purchases were 14 billion pounds, up 22 percent from a year earlier. Purchases in 1984 are expected to be 1 to 3 billion pounds lower because of slightly less production and possibly higher disappearance.

Table 1.—U.S. dairy situation at a glance

Item	Unit or base period	Quarterly data					
		1st 1982	2nd 1982	3rd 1982	4th 1982	1st 1983	2nd 1983
Production and cow numbers:							
Total milk	Mil. lb	33,235	35,723	33,983	32,854	33,955	36,453
Milk per cow	Lb	3,015	3,246	3,082	2,972	3,070	3,294
Number of milk cows	Thou.	11,021	11,004	11,026	11,053	11,059	11,068
Prices received by farmers:							
All milk, sold to plants, 100 pounds	Dol	13.83	13.30	13.37	13.87	13.73	13.33
Percentage of parity[1]	Pct	66	66	65	63	62	63
Manufacturing grade milk, 100 pounds	Dol	12.83	12.43	12.40	12.97	12.80	12.53
Parity equivalent	Dol	18.68	18.86	18.98	18.86	19.78	20.02
Fat content	Pct	3.77	3.61	3.57	3.82	3.75	3.62
Minnesota-Wisconsin (3.5% fat), 100 pounds	Dol	12.49	12.43	12.44	12.58	12.58	12.51
Milk eligible for fluid market, 100 pounds	Dol	13.97	13.43	13.50	14.03	13.93	13.47
Price ratio and dairy ration value:							
Milk/16-percent feed price relationship	Lb.	1.54	1.47	1.51	1.61	1.56	1.45
Value of concentrate ration fed, milk cows	Dol	7.60	7.50	7.66	7.31	7.28	7.46
Farm cash receipts from dairy products	Mil. dol	4,570	4,731	4,515	4,538	4,632	4,825
Production of factory products:							
Butter	Mil. lb	366.6	334.0	256.4	300.0	380.7	357.1
American cheese, whole milk	Mil. lb	662.1	759.4	673.2	655.7	705.2	819.3
Cheese other than American	Mil. lb	411.9	443.5	448.1	485.8	439.1	454.1
Canned milk, unskimmed	Mil. lb	173.7	195.6	184.0	181.6	163.6	183.4
Dry whole milk	Mil. lb	26.2	29.4	22.4	24.3	26.6	26.9
Frozen products[2]	Mil. gal	249.3	333.7	345.8	247.5	263.2	348.4
Creamed cottage cheese	Mil. lb	181.2	197.4	191.2	172.1	184.9	192.7
Total (milk-equivalent, fat-solids basis)[3]	Mil. lb	19,531	21,652	19,470	18,445	20,569	22,753
Nonfat dry milk, human use	Mil. lb	347.2	417.5	339.0	296.9	368.4	451.8
Wholesale prices:							
Butter, Grade A, Chicago, pound	Ct	147.6	147.3	148.0	147.9	147.2	147.3
Cheese, American (40-pound blocks), f.o.b. Wisconsin assembling points, pound	Ct	137.7	137.2	137.8	140.4	138.6	137.5
Evaporated milk, case	Dol2	21.99	22.02	22.02	22.02	22.16	22.23
Nonfat dry milk, pound, f.o.b. Central States, high heat	Ct	93.3	93.0	93.1	93.2	93.4	93.4
Dairy products (BLS)	1967=100	247.9	248.5	248.8	250.3	250.8	250.8
Retail prices (BLS):							
Consumer price index[4]	1967=100	283.0	287.3	292.8	293.4	293.2	296.9
All food[4]	1967=100	282.4	285.7	287.8	286.6	289.2	292.1
All dairy products[4]	1967=100	246.3	246.9	247.3	247.4	249.6	250.1
Fluid milk and cream	12/77=100	135.3	135.6	135.4	135.2	136.7	136.5
Whole milk	1967=100	221.5	221.8	221.2	221.2	223.5	223.2
Other	12/77=100	135.3	135.8	135.9	135.3	137.3	136.8
Manufactured dairy products	12/77=100	144.7	145.2	146.1	146.5	147.2	148.3
Butter	1967=100	249.4	250.7	251.8	252.4	253.5	253.7
Cheese	12/77=100	142.7	143.6	144.6	144.6	145.4	146.3
Frozen desserts	12/77=100	150.1	149.7	150.1	151.5	152.1	153.2
Other	12/77=100	139.3	139.4	141.0	141.2	142.4	144.1
Margarine	1967=100	257.1	260.2	258.5	257.5	257.0	258.
Stocks, end of quarter:							
Creamery butter	Mil. lb	447.8	541.6	510.0	466.8	533.0	588.5
Cheese total[5]	Mil. lb	898.0	994.8	1,054.2	1,064.2	1,145.7	1,194.7
Canned milk, unskimmed	Mil. lb	48.2	89.6	104.3	52.9	49.1	76.7
Dry whole milk	Mil. lb	6.9	9.6	7.3	6.0	5.0	5.8
Total (milk-equivalent, fat-solids basis)[5]	Mil. lb	18,022	20,990	20,916	20,054	22,204	23,847
Nonfat dry milk	Mil. lb	975.6	1,132.4	1,240.1	1,282.0	1,305.7	1,400.9
Commercial disappearance:							
Creamery butter	Mil. lb	211.4	217.6	217.1	251.0	208.3	208.5
Cheese, American	Mil. lb	541.3	546.1	549.4	528.1	459.2	558.4
Cheese, other than American	Mil. lb	462.9	484.5	501.0	596.2	496.1	495.9
Canned milk, unskimmed	Mil. lb	170.6	150.1	164.7	230.0	163.3	153.0
Milk in all products	Mil. lb	28,654	30,942	31,794	31,042	27,943	30,526
Nonfat dry milk	Mil. lb	105.0	75.5	142.3	120.2	109.0	111.2
USDA net removals:							
Butter	Mil. lb	164.1	130.7	42.9	44.6	172.5	148.9
Cheddar cheese	Mil. lb	127.9	220.1	177.3	117.1	209.7	272.2
Nonfat dry milk	Mil. lb	235.0	309.3	234.7	173.9	271.6	331.4
Evaporated milk	Mil. lb	3.9	5.5	6.0	5.3	5.3	5.0
Total (milk-equivalent, fat-solids basis)	Mil. lb	4,660	4,886	2,651	2,089	5,645	5,776

[1]Seasonally adjusted prices as percentage of parity price. [2]Ice cream, ice milk, and sherbet. [3]Includes manufactured products for which current data are available. [4]For all urban consumers starting January 1978. [5]Natural plus processed American cheese held by CCC. [6]Excludes cream and bulk condensed milk.

PRICES AND INCOME

Support Set at Minimum; Second 50-Cent Deduction Starts

The support price for the 1983/84 marketing year was announced at $13.10 per cwt for manufacturing-grade milk with 3.67-percent fat ($12.80 at 3.5-percent fat). This level of support is the minimum allowed under dairy legislation contained in Title I of the Omnibus Budget Reconciliation Act of 1982, and is the same price that has basically been in effect since October 1, 1980. Furthermore, on September 1, 1983, the Secretary of Agriculture implemented a second 50-cent-per-cwt deduction from the proceeds of farm sales of all milk marketed commercially. This deduction, along with an earlier 50-cent deduction that started April 16, 1983, will be in place for 1983/84.

The Secretary is authorized by the 1982 budget law to collect the first 50 cents per cwt if purchases by the Commodity Credit Corporation (CCC) are expected to be more than 5 billion pounds, milk-equivalent, during the marketing year. The collection of a second 50 cents is authorized if removals are expected to be more than 7.5 billion, and a refund program for the second deduction has been established for those producers who cut marketings by a specified amount.

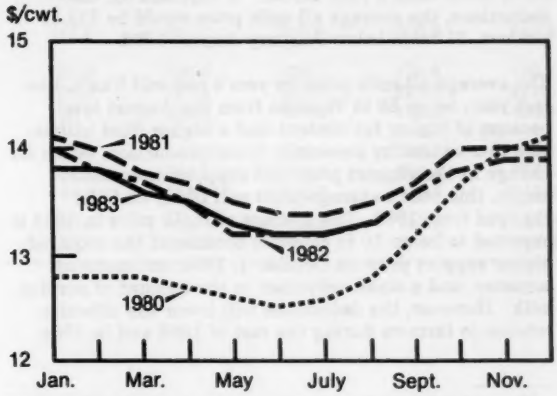
For a refund of September 1983's deductions, producers must reduce their sales during September 1983 by 8.4 percent from the average of their September 1981 and September 1982 sales. For a refund of the deductions from October 1, 1983, through September 30, 1984, producers must reduce marketings 8.4 percent from their base—the average annual marketings during October 1, 1980, through September 30, 1982. Producers are to establish their marketing base at their county offices of the Agricultural Stablization and Conservation Service any time during the marketing year. Applications for September 1983 refunds must be filed before December 31, 1983. Applications for refunds for all of next year must be filed before December 31, 1984. Producers may request an advance of 60 percent of the refundable deduction to be paid during the first 6 months of 1983/84 any time on or after April 1, 1984.

Farm Milk Prices Equal Last Year

Milk prices received by farmers in August were equal with a year earlier, but down seasonally from January. The unchanged price from a year earlier was the result of continued surplus production and an unchanged support price. The drop was the result of the seasonally lower fat content from January to August, and also a lower proportion of fluid utilization in August. Fluid milk has a higher selling price, so other things being equal, the lower the fluid share of the total, the lower the all-milk price.

August prices for manufacturing-grade milk averaged $12.30 per cwt—down 70 cents (4.6 percent) from January, but equal with a year earlier. After adjusting to 3.67-percent fat, the price was $12.58, 52 cents below support. August marked the 41st consecutive month that prices for manufacturing-grade milk failed to reach support. The simple average of reported prices during January-August 1983 was $12.57, only 2 cents more than

All Milk Prices*



*U.S. average price received by farmers for deliveries to plants and dealers.

USDA Neg. ERS 5449-83(9)

Table 2.—Milk prices received by farmers, by months, 1980-83

Month	All sold to plants				Manufacturing grade			
	1980	1981	1982	1983	1980	1981	1982	1983
	Dollars per cwt							
January	12.80	14.10	14.00	13.80	11.70	13.00	13.00	12.90
February	12.80	14.00	13.80	13.80	11.70	12.90	12.80	12.80
March	12.80	13.80	13.70	13.60	11.80	12.80	12.70	12.70
April	12.70	13.70	13.50	13.50	11.80	12.70	12.60	12.70
May	12.60	13.50	13.20	13.30	11.70	12.60	12.40	12.50
June	12.50	13.40	13.20	13.20	11.70	12.50	12.30	12.40
July	12.60	13.40	13.20	13.20	11.60	12.40	12.30	12.30
August	12.80	13.50	13.30	13.30	11.80	12.40	12.30	12.30
September	13.20	13.70	13.60		12.20	12.60	12.60	
October	13.70	14.00	13.80		12.70	12.90	12.90	
November	14.00	14.00	13.90		12.90	13.00	13.00	
December	14.10	14.00	13.90		13.00	13.00	13.00	
Wt. average	13.00	13.80	13.60		12.00	12.70	12.60	

last year. However, if adjusted for the 50-cent deductions, the effective return during January-August was $12.29, down 28 cents from 1982. The 1983 average price for manufacturing-grade milk is expected to be nearly unchanged from 1982, and under current law the average for 1984 will likely be up 10 to 80 cents.[1]

Minimum Class I prices in Federal order markets continue to drop slightly. For October, the average Class I price will be $14.63 per cwt, down only 14 cents from the high of $14.77 reached early this year and 4 cents above October of 1982.

Over-order prices negotiated by cooperative associations generally continue to be stable. The estimated average over-order payment in September was 58 cents per cwt, down 5 cents from the previous month. This 5-cent change was the largest month-to-month change during the last 17 months. During this period, the difference between the high and the low month has been only 6 cents.

Farm prices for all milk averaged $13.30 per cwt in August, unchanged from a year earlier. For the first 8 months of this year, the all-milk price averaged only 3 cents lower than a year earlier. If adjusted for the deductions, the average all-milk price would be $13.31 per cwt, 31 cents below January-August 1982.

The average all-milk price by year's end will likely, like last year, be up 50 to 70 cents from the August level because of higher fat content and a higher fluid utilization rate caused by seasonally lower production. With no change in the support price and supplies more than ample, this year's average price will likely be little changed from 1982. The average all-milk price in 1984 is expected to be up 10 to 80 cents because of the required higher support price on October 1, 1984, an improved economy, and a small reduction in the amount of surplus milk. However, the deductions will lower the effective returns to farmers during the rest of 1983 and in 1984.

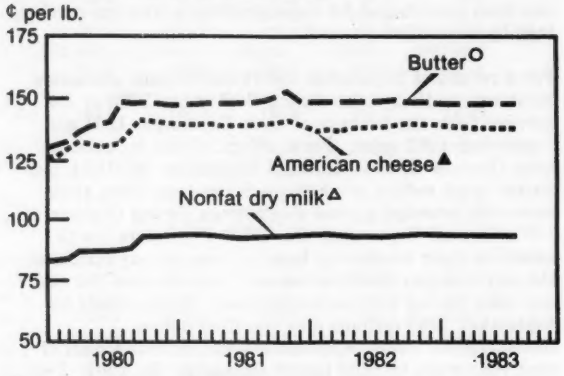
[1]Current law requires that the minimum support price of milk be the same level of parity on October 1, 1984, that $13.10 per cwt was on October 1, 1983. The $13.10 will likely be 65 percent of parity, thus the minimum price for October 1, 1984 is projected at $14.18.

Wholesale Prices Nearly Unchanged

The August wholesale price of Grade A butter (Chicago) was approximately $1.48 a pound, up less than 1 cent from January and nearly even with August 1981 and 1982. On the Chicago Mercantile Exchange, the mid-September 1983 butter prices were 8 cents higher than in mid-June; last year the prices advanced 2 cents. However, last year the gain was in July; this year prices did not move upward until August. The continued upward price movement during September was likely the result of the hot weather. The hot weather improved ice cream sales and lowered fat tests, which likely caused temporary tightness in the cream market. The recent price increases may not be retainable.

Meanwhile, the price of cheddar cheese in 40-pound blocks at Wisconsin assembly points averaged just over $1.37 a pound, about 2 cents lower than January and down less than a cent from a year earlier. The price of nonfat dry milk in the Central States averaged 93.4 cents a pound, unchanged from January and less than a

Wholesale Dairy Product Prices



○ Grade AA Chicago. △ High-heat, central-states. ▲ 40-lb. block, Wisconsin assembly points.

USDA

Neg. ERS 79-83(9)

Table 3.—Wholesale dairy product prices and indexes

Item	Unit	Aug. '81	Avg. '81	Aug. '82	Avg. '82	Jan. '83	Apr. '83	Aug. '83
Butter, A, Chicago	cents/lb	148.03	147.99	148.07	147.69	147.25	147.25	147.75
Cheese, 40-lb blocks, Wisconsin assembly points	cents/lb	139.26	139.44	137.76	138.27	139.33	137.64	137.05
Nonfat dry milk, Central States, high heat	cents/lb	92.83	93.11	93.12	93.15	93.38	93.38	93.38
Wholesale price index (all dairy products)	(1967=100)	245.3	245.6	248.8	248.9	250.7	251.0	250.4
Fresh whole milk	(1967=100)	194.2	194.4	198.2	197.9	199.7	200.0	199.5
Butter	(1967=100)	224.8	225.6	227.4	226.9	226.1	226.4	226.4
Cheese	(1967=100)	308.5	309.4	315.8	313.2	315.7	314.4	313.5
Nonfat dry milk	(1967=100)	460.3	462.6	461.5	462.9	464.0	462.7	462.7
Ice cream	(1967=100)	233.6	232.8	235.1	235.9	238.3	240.8	239.5

Table 4.—Retail dairy product prices

Item	Unit	July 1981	Avg. 1981	July 1982	Avg. 1982	Jan. 1983	May 1983	July 1983
Milk, fresh, whole[1]	$ per 1/2 gal	1.118	1.117	1.123	1.124	1.134	1.128	1.127
Milk, fresh, skim	$ per 1/2 gal	.980	.976	.978	.979	.993	.986	.985
Milk, fresh, lowfat	$ per 1/2 gal	1.058	1.065	1.064	1.062	1.088	1.086	1.088
Butter, salted, Grade AA, sticks	$ per lb	1.992	1.993	2.057	2.046	2.048	2.072	2.069
Ice cream, pre-packaged, bulk, regular	$ per 1/2 gal	2.024	2.016	2.092	2.102	2.179	2.140	2.122
Yogurt, natural, fruit-flavored	$ per 1/2 pt	.504	.500	.513	.503	.514	.511	.510

[1]Vitamin D fortified.

Table 5.—Retail price indexes[1]

Item	Index base	July 1981	Avg. 1981	July 1982	Avg. 1982	Jan. 1983	May 1983	July 1983
Consumer price index	1967=100	274.4	272.4	292.2	289.1	293.1	297.1	299.3
All food	1967=100	276.2	274.6	288.5	285.7	288.1	292.4	292.0
All dairy products	1967=100	244.2	243.6	247.5	247.0	249.5	250.3	249.8
Fluid milk and cream	12/77=100	134.9	134.5	135.6	135.4	136.7	136.5	136.2
Whole milk	1967=100	220.7	220.2	221.6	221.4	223.7	223.2	222.8
Other	12/77=100	134.9	134.5	136.2	135.6	136.9	136.8	136.4
Manufactured dairy products	12/77=100	142.5	142.2	145.9	145.6	147.1	148.6	148.2
Butter	1967=100	245.8	245.5	251.1	251.1	253.4	254.4	253.3
Cheese	12/77=100	140.7	140.3	144.2	143.9	145.2	146.5	146.9
Frozen desserts	12/77=100	147.6	147.3	150.4	150.4	152.5	153.6	151.6
Other	12/77=100	136.6	136.3	141.3	140.2	141.6	144.6	144.5

[1]For all urban consumers.

half-cent higher than August 1982. Reflecting the steady wholesale spot prices, the Bureau of Labor Statistics' (BLS) August wholesale price index for all dairy products equaled 250.4 (1967=100), up less than 1 percent from a year earlier and down slightly since April.

With current CCC purchase prices unchanged, stable wholesale prices are expected to continue for the rest of this year and through summer 1984 because of the large supply of milk available for manufacturing. Wholesale prices are projected to move higher late in 1984 because of the current law and its required higher level of support on October 1, 1984.

Retail Price Gains Remain Small

The BLS retail price index for all dairy products was 249.8 (1967 = 100) in July, up less than 1 percent from a year earlier and down slightly since May. Prices are reflecting still-sluggish demand and more-than-ample supplies of all dairy products. Retail dairy prices will likely be up about 1.5 percent in 1983 and 2 to 4 percent in 1984. Retail prices for all food are expected to be up 2 to 4 percent in 1983 and 4 to 7 percent in 1984.

Retail Food and Dairy Product Prices

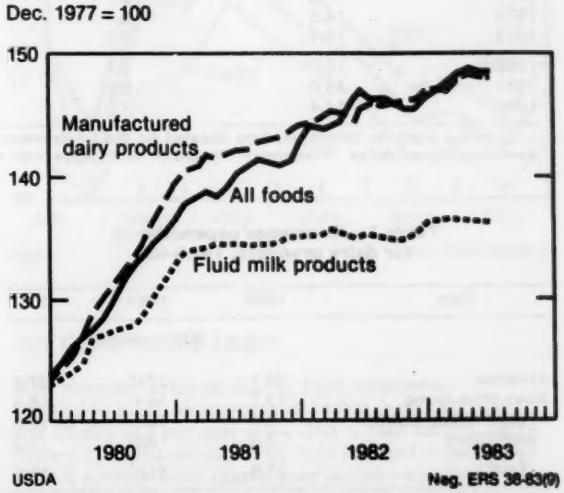


Table 6.—Consumer expenditures for food and dairy products, income, and labor required to purchase specified dairy products, selected years, 1950-82

Year	Consumer expenditures			Disposable personal income	Hourly wage rate[2]
	For all foods[1]	For dairy products			
		Amount	Percentage all food		
	Billion dollars	*Million dollars*	*Percent*	*Billion dollars*	*Dollars*
1950	46.0	8,157	17.7	205.4	1.44
1955	58.1	10,301	17.7	273.3	1.86
1960	70.5	12,098	17.2	352.0	2.26
1965	85.8	13,049	15.2	475.8	2.61
1970	119.6	16,729	14.0	695.3	3.35
1971	123.4	15,176	12.3	751.8	3.57
1972	132.4	17,957	13.6	810.3	3.82
1973	147.9	19,294	13.0	914.5	4.09
1974	167.5	21,823	13.0	998.3	4.42
1975	185.2	23,316	12.6	1,096.1	4.83
1976	200.4	26,386	13.2	1,194.4	5.22
1977	217.4	27,781	12.8	1,314.0	5.68
1978	240.9	30,132	12.5	1,474.0	6.17
1979	272.2	33,492	12.3	1,650.2	6.69
1980	300.0	37,798	12.6	1,824.1	7.27
1981	329.1	41,417	12.6	2,029.1	7.99
1982[3]	349.7	43,814	12.5	2,173.4	8.50

	Time worked to earn money to purchase[4]				
	Butter, 1-lb.	Milk at stores 1/2-gal.	American cheese, 1/2-lb.	Ice cream, 1/2-gal.	Evaporated milk, 14-1/2-oz. can
	Minutes				
1950	29.6	15.8	11.7	[5]35.6	5.1
1955	22.5	13.8	10.2	26.6	4.3
1960	19.5	12.8	9.0	22.2	4.1
1965	17.3	10.9	8.7	18.1	3.5
1970	15.5	10.3	9.0	15.1	3.4
1971	14.5	9.9	8.9	14.4	3.3
1972	13.7	9.4	8.5	13.5	3.1
1973	13.4	9.6	8.9	13.3	3.3
1974	12.8	10.4	9.9	14.6	3.9
1975	12.7	9.6	9.5	15.2	3.8
1976	14.7	9.3	9.9	14.6	3.9
1977	14.3	8.7	9.4	14.3	3.8
1978	14.5	8.4	9.3	14.2	3.7
1979	15.1	8.6	9.6	14.6	3.7
1980	15.5	8.7	9.7	15.0	3.8
1981	15.0	8.4	9.6	15.1	3.7
1982[3]	14.4	7.9	9.3	14.8	3.6

[1]Excludes alcoholic beverages, food donated by the Government, nonpersonal spending for food, and institutional food use. [2]Average of all manufacturing industries. [3]Preliminary. [4]Based on hourly wage rates of all manufacturing industries. [5]1951.

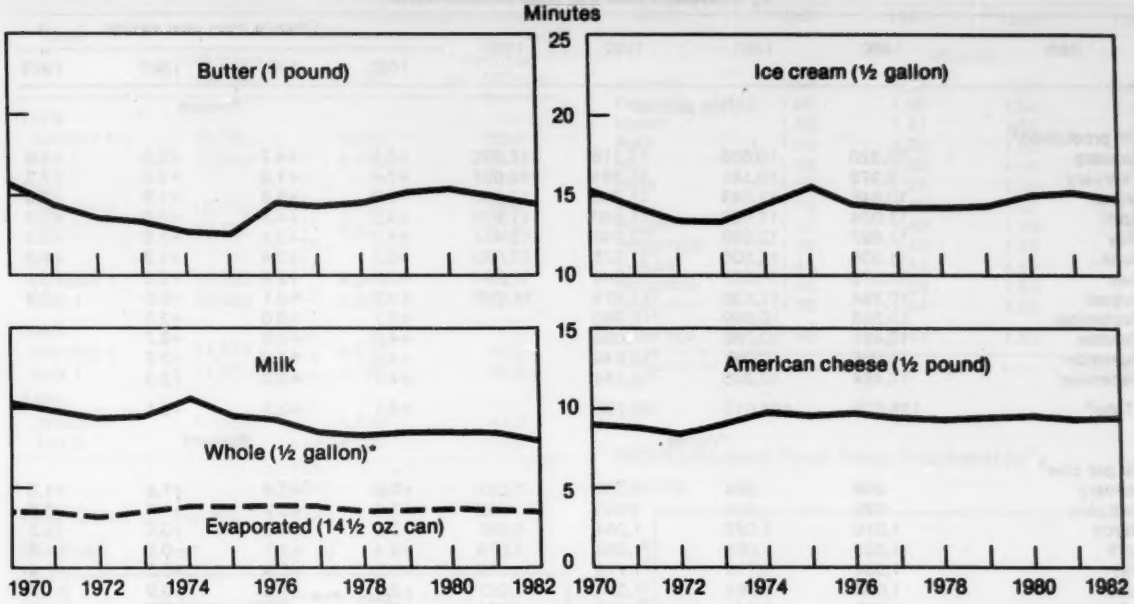
Table 7.—Consumer expenditures for dairy products, 1980-82

Item	1980	1981	1982
	Billion dollars		
At-home	25.1	27.0	27.5
Away-from-home	12.7	14.4	16.3
Public eating places	9.4	10.9	12.3
Institutions	3.3	3.5	4.0
Total	37.8	41.4	43.8

Consumer Dairy Expenditures Higher

Consumers spent $43.8 billion for dairy products during 1982, up 5.8 percent from 1981. However, less than half of the increase was a result of higher prices for dairy products; the BLS retail price index for dairy was up 1.4 percent, while commercial disappearance (sales) increased 1.6 percent. Part of the gain was because expenditures away from home increased proportionally more than purchases for home consumption. Away-from-home use accounted for 37.2 percent of all dairy expenditures, increasing 2.4 percentage points from 1981.

Minutes Worked Earning Money to Buy Selected Dairy Products △



△ Data are based on hourly wage rates of all manufacturing industries. *Bought at stores.

USDA

Neg. ERS 6890-83(9)

Smaller Share of Wages Needed To Buy Dairy Products

In 1982, wages rose 6.4 percent, while retail prices of dairy products increased 1.4 percent. As a result, the average wage earner in all manufacturing industries had to work fewer minutes to earn money to purchase dairy products. For example, it took 7.9 minutes to earn the money to buy a half-gallon of fresh whole milk in 1982, down from 8.4 minutes in 1981. There were similar decreases in the work time required to purchase butter, American cheese, ice cream, and canned evaporated whole milk. With retail prices expected to be up only about 1.5 percent in 1983 and 2 to 4 percent in 1984, the time needed to buy dairy items will likely decline again.

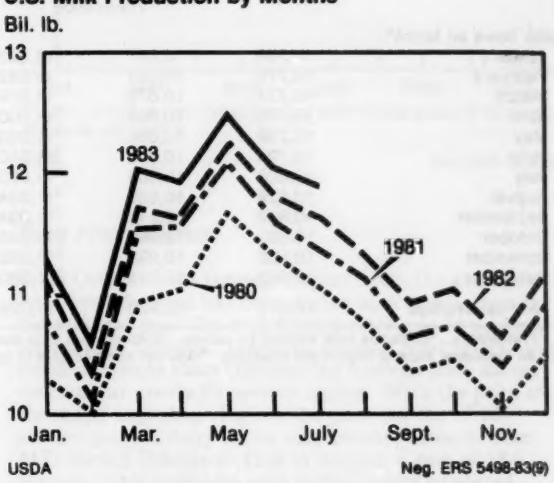
PRODUCTION

Production Gains Continue

Milk production during June-August was up 2.1 percent from a year earlier, as August was the 52nd consecutive month of a year-to-year increase. The increased milk production was the result of more cows and more milk per cow.

During April-June, milk production in the five leading States was up in New York (4.4 percent), Minnesota (3.3 percent), and Pennsylvania (1.9 percent), but it declined in California (0.4 percent) and Wisconsin (0.5 percent). Production during the second quarter was even with or below year-earlier levels in 17 States and higher in 33.

U.S. Milk Production by Months



USDA

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July Cow Inventory Larger

Milk cows on farms on July 1, 1983, numbered 11,080,000 head, an increase of 14,000 from January 1 and 60,000 (0.5 percent) more than a year earlier. Dairy heifers (500 pounds and over) held for herd replacement were 2 percent more than a year earlier—nearly 4.9 million head. With a larger relative gain in heifers than in

Table 8.—Milk production, milk per cow, and milk cows on farms, by months, 1980-83, with comparisons

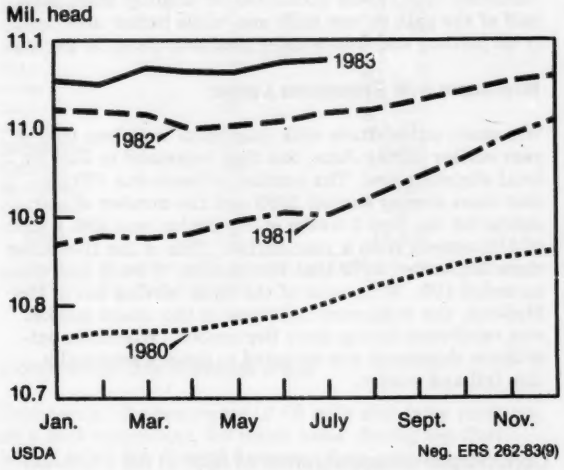
Item	1980	1981	1982	1983[1]	Change from year earlier			
					1980	1981	1982	1983
	Million pounds				*Percent*			
Milk production[2]								
January	10,320	10,805	11,116	11,292	+3.6	+4.7	+2.9	+1.6
February	9,972	10,161	10,391	10,627	+7.4	+1.9	+2.3	+2.3
March	10,945	11,549	11,728	12,036	+3.9	+5.5	+1.5	+2.6
April	11,024	11,555	[3]11,650	11,933	+4.0	+4.8	+0.8	+2.4
May	11,697	12,099	[3]12,248	12,487	+4.0	+3.4	+1.2	+2.0
June	11,335	11,606	[3]11,825	12,033	+3.5	+2.4	+1.9	+1.8
July	11,075	11,387	[3]11,648	11,894	+3.7	+2.8	+2.3	+2.1
August	10,794	11,132	[3]11,375	11,639	+3.7	+3.1	+2.2	+2.3
September	10,353	10,659	[3]10,960		+3.7	+3.0	+2.8	
October	10,461	10,768	[3]11,055		+4.0	+2.9	+2.7	
November	10,055	10,387	[3]10,645		+4.5	+3.3	+2.5	
December	10,494	10,905	[3]11,154		+4.1	+3.9	+2.3	
Total[4]	128,525	133,013	135,795		+4.1	+3.5	+2.1	
	Pounds				*Percent*			
Milk per cow[2]								
January	958	994	1,008	1,021	+3.8	+3.8	+1.4	+1.3
February	926	934	943	962	+7.4	+0.9	+1.0	+2.0
March	1,016	1,062	1,064	1,087	+3.6	+4.5	+0.2	+2.2
April	1,023	1,061	[3]1,059	1,078	+3.4	+3.7	−0.2	+1.8
May	1,084	1,110	[3]1,113	1,129	+3.3	+2.4	+0.3	+1.4
June	1,050	1,064	[3]1,074	1,087	+2.6	+1.3	+0.9	+1.2
July	1,025	1,044	[3]1,057	1,074	+2.8	+1.9	+1.2	+1.6
August	997	1,018	[3]1,032	1,050	+2.7	+2.1	+1.4	+1.7
September	955	974	[3] 993		+2.8	+2.0	+2.0	
October	964	982	[3]1,001		+3.0	+1.9	+1.9	
November	926	945	[3] 963		+3.5	+2.1	+1.9	
December	966	990	[3]1,008		+3.3	+2.5	+1.8	
Total[4]	11,889	12,177	12,316		+3.5	+2.4	+1.1	
	Thousands				*Percent*			
Milk cows on farms[5]								
January	10,769	10,871	11,023	11,055	−0.2	+0.9	+1.4	+0.3
February	10,773	10,881	11,022	11,051	+0.1	+1.0	+1.3	+0.3
March	10,774	10,879	11,019	11,070	+0.3	+1.0	+1.3	+0.5
April	10,775	10,886	[3]11,000	11,067	+0.5	+1.0	+1.0	+0.6
May	10,789	10,898	[3]11,003	11,064	+0.7	+1.0	+1.0	+0.6
June	10,794	10,906	[3]11,010	11,074	+0.8	+1.0	+1.0	+0.6
July	10,803	10,904	[3]11,020	11,078	+0.9	+0.9	+1.1	+0.5
August	10,829	10,930	[3]11,024	11,080	+1.0	+0.9	+0.9	+0.5
September	10,838	10,949	[3]11,034		+0.8	+1.0	+0.8	
October	10,852	10,969	[3]11,045		+0.9	+1.1	+0.7	
November	10,858	10,993	[3]11,055		+1.0	+1.2	+0.6	
December	10,862	11,011	[3]11,060		+0.8	+1.4	+0.4	
Annual average	10,810	10,923	11,026		+0.6	+1.0	+0.9	

[1]Preliminary. [2]Excludes milk sucked by calves. [3]ERS derived data consistent with published official USDA quarterly estimates. No monthly data for an individual state or region are available. [4]May not add because of rounding. [5]Excludes heifers not yet fresh.

Table 9.—Milk cows and replacements, 1979-83

Date	Milk cows (1,000 head)	Replacement heifers, 500 pounds and over	
		Number	Number per 100 cows
1979			
January 1	10,790	3,932	36.4
July 1	10,700	4,115	38.4
1980			
January 1	10,779	4,158	38.6
July 1	10,798	4,377	40.5
1981			
January 1	10,860	4,345	40.0
July 1	10,920	4,628	42.4
1982			
January 1	11,012	4,532	41.2
July 1	11,020	4,780	43.4
1983			
January 1	11,066	4,532	41.0
July 1	11,080	4,880	44.0

Milk Cows on Farms



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milk cows, the number of heifers was 44 per 100 cows, up from the July 1, 1982, record of 43.4.

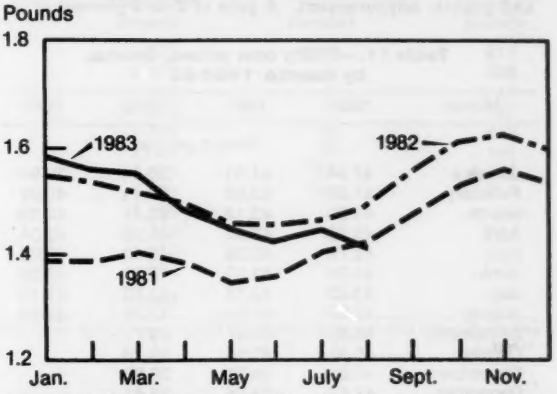
A high rate of culling during first-half 1983 partly offset the impact of large supplies of replacements. For example, if we assume that 35 percent of the January 1 replacement inventory entered the herd during the first half, then 14.2 percent of the herd was culled during January-June 1983—a rate exceeded only by January-June 1982. During second-half 1983, the rate of culling is expected to be record large because of lower effective milk prices and higher feed costs. From 200,000 to 400,000 additional cows are expected to be culled this year, with all of the increase in the second half. On January 1, 1984, the dairy herd is expected to be slightly less than 10.9 million cows, about 225,000 head lower than on July 1, 1983. The herd is expected to decline again by about 100,000 cows from January 1 to July 1, 1984, as net returns for milk continue to decline.

Table 10.—Milk/16-percent feed price relationship, by months, 1980-83[1]

Month	1980	1981	1982	1983
	Pounds			
January	1.54	1.39	1.55	1.58
February	1.56	1.39	1.54	1.56
March	1.56	1.41	1.52	1.55
April	1.55	1.39	1.50	1.48
May	1.53	1.35	1.46	1.45
June	1.50	1.36	1.46	1.43
July	1.48	1.40	1.47	1.45
August	1.42	1.43	1.49	1.41
September	1.40	1.48	1.56	
October	1.43	1.53	1.61	
November	1.40	1.56	1.63	
December	1.39	1.54	1.60	
Average	1.48	1.44	1.53	

[1]Pounds of 16-percent protein ration equal in value to 1 pound of milk.

Milk/16-Percent Feed Price Relationship*



*Pounds of 16% protein ration equal in value to one pound of milk sold to plants and dealers.

USDA Neg. ERS 40-83(9)

Feed Prices Higher

From October 1982 through August 1983, the average farm price for corn has been higher each month than in the previous one. The mid-August price was 74 percent higher than October. Likewise, soybean meal prices have trended upward since October; the average price during August was nearly 50 percent higher. With the price of the major ingredient higher, the price per ton of 16-percent protein dairy ration also trended upward, from $171 during October to $189 in August, a gain of 10.5 percent. This moderate gain in feed prices compared with the large increase in ingredient costs has occurred because the feed manufacturers have reduced their margins and have not passed all of the increased costs on to the dairy farmer. In addition, the higher prices may not yet be higher costs to feed makers because of previous contract purchases.

The upward trend in feed prices, when coupled with an all-milk price that first was nearly static and then declined seasonally from February to August, resulted in

a milk/feed price relationship that trended lower each month. During August, the ratio was 1.41, compared with 1.61 for October 1982. The ratio will likely move somewhat lower for the next month or two, but with seasonally higher milk prices it should flatten out or improve slightly late this fall and during the winter. The relationship is expected to improve sharply during second-half 1984 because of a drop in feed prices and higher milk prices given the current law. However, if adjusted for the deductions, the ratio will likely continue to decline slightly until mid-1984 and then improve.

Gains in Milk Production Expected To Slow

Milk output per cow during March was 2.2 percent larger than a year earlier. The estimated gains during April, May, and June were 1.8, 1.4, and 1.2 percent, respectively. However, July and August turned the slowing pace of gains around, as output was up 1.6 and 1.7 percent, respectively. The year-over-year gain in output per cow is expected to continue, despite higher feed prices, because of very high culling rates, better management, and genetic improvement. A gain of 2 to 3 percent is projected for 1984 because of feed costs that will likely decline next summer, the addition of 35 pounds of milk per cow due to leap year, and improved management and genetics. For all of 1983, output per cow is expected to increase about 1.5 percent.

With cow numbers expected to decline sharply this fall while gains in output improve somewhat, the pace of increase in milk production will likely slow. Total production in 1983 is likely to be up 1.5 to 2 percent from 1982's record 135.8 billion pounds. With gains in output per cow nearly offsetting the decline in cow numbers, milk production in 1984 is projected to be down slightly.

Table 11.—Utility cow prices, Omaha, by months, 1980-83

Month	1980	1981	1982	1983
		Dollars per cwt		
January	47.94	41.61	36.64	36.94
February	51.22	43.65	38.11	40.92
March	48.80	43.12	39.41	42.36
April	45.73	43.95	41.26	43.04
May	42.78	42.39	43.40	42.98
June	44.06	42.88	42.73	42.26
July	43.33	43.78	42.52	41.14
August	45.53	44.31	42.25	39.63
September	46.56	42.47	39.71	
October	45.93	40.60	39.28	
November	43.91	38.71	36.58	
December	42.92	36.65	35.41	
Average	45.73	42.01	39.77	

UTILIZATION

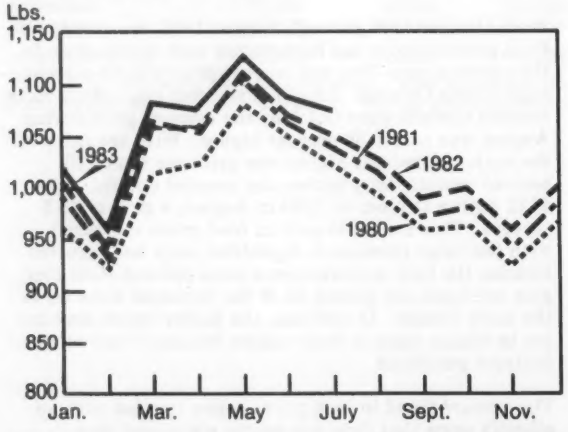
Output of Manufactured Dairy Products Still Large

The amount of milk used to make manufactured dairy products during April-June was 22.8 billion pounds, a gain of 1.1 billion pounds (5.1 percent) from second-quarter 1982. On a milk-equivalent, fat-solids basis, American-type cheese accounted for slightly more than half of the gain in raw milk use, while butter used nearly 40 percent and frozen dairy products about 10 percent.

Wisconsin Milk Shipments Larger

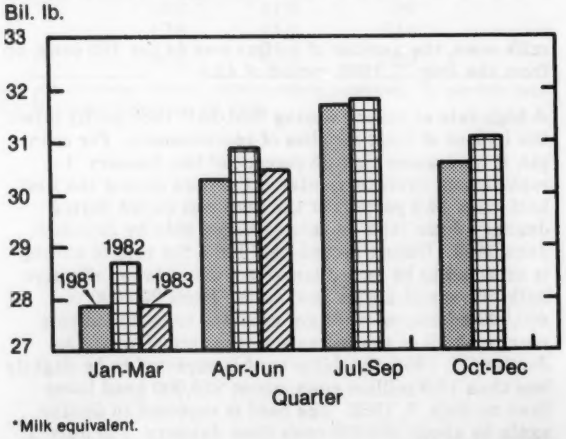
Wisconsin out-of-State milk shipments were less than a year earlier during June, but then increased in July to total slightly more. The number of loads was 170 percent more during August 1983 and the number of shipments for the first 2 weeks of September was 205, a gain of 210 percent from a year earlier. This is the first time since September 1979 that the number of loads in a week exceeded 100. With most of the loads moving out of the Midwest, the temporary tightness in the cream market was reinforced during early September. Wisconsin out-of-State shipments are expected to decline seasonally this fall and winter.

Milk Production Per Cow



USDA Neg. ERS 261-83(9)

Commercial Disappearance of Milk in All Products*



*Milk equivalent.

USDA Neg. ERS 2075-83(9)

Table 12.—Production of selected manufactured dairy products with comparisons

Item	Units	Jan.-June 1981	Percent change from 1980	Jan.-June 1982	Percent change from 1981	Jan.-June 1983[1]	Percent change from 1982
Butter	Mil. lb	675.6	+7.3	700.6	+3.7	737.8	+5.3
American cheese	Mil. lb	1,395.6	+13.9	1,421.5	+1.9	1,524.5	+7.2
Other cheese	Mil. lb	803.7	+2.2	855.4	+6.4	893.2	+4.4
Cottage cheese[2]	Mil. lb	505.9	−1.9	500.8	−1.0	491.1	−1.9
Canned milk	Mil. lb	369.8	−3.6	369.4	−.1	347.0	−6.1
Dry whole milk	Mil. lb	43.1	+6.2	55.5	+28.8	53.5	−3.6
Ice cream	Mil. gal	406.7	−.5	420.9	+3.5	439.2	+4.3
Milk equivalent[3]	Bil. lb	40.1	+7.5	41.2	+2.7	43.3	+5.1
Nonfat dry milk	Mil. lb	697.3	+11.4	764.7	+9.7	820.1	+7.2

[1]Preliminary. [2]Creamed and lowfat. [3]Total reported manufactured products using unrounded data.

Table 13.—Wisconsin out-of-State milk shipments

Month	1981		1982[1]		1983[1]	
	Loads	Volume	Loads	Volume	Loads	Volume
	Number	*Thousand pounds*	*Number*	*Thousand pounds*	*Number*	*Thousand pounds*
January	4	188	57	2,679	13	611
February	7	329	31	1,457	7	329
March	2	94	20	940	1	47
April	0	0	7	329	1	47
May	0	0	15	705	[2]9	423
June	0	0	22	1,034	[2]3	141
July	48	2,256	25	1,175	[2]28	1,316
August	41	1,927	23	1,081	[2]62	2,914
September	118	5,546	68	3,196		
October	25	1,175	20	940		
November	40	1,880	50	2,350		
December	23	1,081	14	658		
Total	308	14,476	352	16,544		

[1]Changes in marketing practices in the Chicago market and adjacent Federal order markets may affect the comparability of this data. [2]Includes out-of-State skim milk shipments.

Commercial Use Remains Weak

Commercial disappearance of all milk and dairy products, on a milk-equivalent, fat-solids basis, during the first half of 1983 was down 1.9 percent from a year earlier. This decline occurred despite nearly a 1 percent larger population and higher per capita disposable income. The weak sales may have been partly caused by the large donations under the needy persons program. Under the program, eligible recipients have likely reduced commercial purchases. In addition, since the emergency food assistance program was designed to avoid placing demands on State and local food distribution agencies through excessive federal oversight, it is also likely that some dairy products were given to secondary recipients by participants who may have been unable to use their entire allotment. In an effort to improve the program's efficiency, USDA will soon be providing guidance to States on appropriate eligibility requirements.

For the rest of the year, sales are expected to return to the year-earlier level, leaving yearly disappearance down about 1 percent from 1982. The unchanged sales are because of the improved economy and somewhat large donations. Sales in 1984 are projected to be unchanged to up 2 percent.

Table 14.—Dairy sales, January-June, 1982-83

Item	1982	1983	Change
	Million pounds		
Total milk[1]	59,596.0	58,469.0	−1.9
Manufactured products:			
American cheese	1,087.4	1,017.6	−6.4
Other cheese	947.4	992.0	+4.7
Cottage cheese[2]	500.8	491.1	−1.9
Butter	429.0	416.8	−2.8
Ice cream	420.9	439.2	+4.3
Ice milk	139.8	148.8	+6.4
Canned milk	320.7	316.3	−1.4
Nonfat dry milk	180.5	220.2	+22.0
Fluid products[3]			
Whole milk	9,400.0	9,110.0	−2.9
Skim and lowfat milk	7,671.0	7,852.0	+2.6

[1]On a milk-equivalent, fat-solids-basis. [2]Creamed and low-fat. [3]Based on January-June Federal order data, percent change adjusted for calendar composition and seasonally.

Table 15.—Commercial disappearance: Total milk, annual and quarters, 1981-83[1]

Item	1981	1982[2]					1983	
	Year	Quarters				Year	Quarter	
		I	II	III	IV		I	II
				Billion pounds				
Production	133.0	33.2	35.7	34.0	32.9	135.8	34.0	36.5
Farm use	2.3	.6	.6	.6	.6	2.3	.6	.6
Marketings	130.7	32.7	35.1	33.4	32.3	133.5	33.4	35.9
Beginning commercial stocks	5.8	5.4	5.2	5.0	4.6	5.4	4.6	5.0
Imports	2.3	.4	.6	.6	.9	2.5	.6	.5
Total supply	138.8	38.5	40.9	39.0	37.7	141.3	38.6	41.4
Ending commercial stocks	5.4	5.2	5.0	4.6	4.6	4.6	5.0	5.1
Net removals	12.9	4.7	4.9	2.6	2.1	14.3	5.6	5.8
Commercial disappearance (actual)	120.5	28.7	30.9	31.8	31.1	122.5	27.9	30.5
Percent change[3]	[4]+1.4	+2.5	+2.2	+0.3	+1.6	+1.6	−2.5	−1.3

[1]Milk-equivalent, fat-solids basis. Totals may not add because of rounding. [2]Preliminary. [3]From year earlier, using unrounded data. [4]On a daily average basis.

Table 16.—Commercial disappearance: Selected dairy products, 1974-83[1]

Year	Butter[2]	Cheese		Nonfat dry milk	Canned milk	Frozen products[4]
		American[3]	Other			
			Million pounds			*Million gallons*
1974	929.9	1,780.6	1,276.5	809.9	999.5	1,128.0
1975	951.0	1,717.1	1,331.9	697.0	924.0	1,183.9
1976	919.0	1,920.9	1,458.0	719.2	899.0	1,154.0
1977	859.8	1,958.8	1,512.3	682.2	775.2	1,167.6
1978	903.5	2,064.7	1,655.5	658.4	776.1	1,173.5
1979	895.0	2,113.1	1,730.4	603.1	773.7	1,152.1
1980	878.8	2,023.9	1,827.9	538.9	732.5	1,166.9
1981-1st Qtr.	188.9	528.4	432.5	104.6	177.9	249.0
2nd Qtr.	214.2	518.3	450.4	86.2	159.2	326.5
3rd Qtr.	222.9	544.7	459.8	155.4	167.1	347.7
4th Qtr.	243.2	556.5	532.9	118.0	246.0	244.6
Total	869.2	2,147.9	1,875.6	464.1	750.4	1,167.7
1982-1st Qtr.	211.4	541.3	462.9	105.0	170.6	249.3
2nd Qtr.	217.6	546.1	484.5	75.5	150.1	333.7
3rd Qtr.	217.1	549.4	501.0	142.3	164.7	345.8
4th Qtr.	251.0	528.1	596.2	120.2	230.0	247.5
Total	897.1	2,165.0	2,044.6	443.0	715.3	1,176.2
1983-1st Qtr.[5]	208.3	459.2	496.1	109.0	163.3	263.2
2nd Qtr.	208.5	558.4	495.9	111.2	153.0	348.4

[1]Total may not add because of rounding. [2]Imports include butter-equivalent of butteroil. [3]Imports include colby cheese; stocks do not include processed cheese. [4]Excludes Mellorine. [5]Preliminary.

Table 17.—Milk: Supply and utilization in all dairy products, United States, 1970-82[1]

Year	Supply					Utilization						
	Production	Imports	Beginning stocks		Total	Total use	Exports and shipments		Domestic disappearance			
			Commercial	Government			Commercial[2]	USDA[3]	Fed to calves	Food use		
										Military	Civilian consumption	
											Total	Per capita
	Million pounds											*Pounds*
1970	117,007	1,874	3,798	1,447	124,126	118,323	949	41	1,702	2,419	113,212	561
1971	118,566	1,346	3,705	2,098	125,715	120,611	1,063	1,963	1,635	2,031	113,919	556
1972	120,025	1,694	3,565	1,539	126,823	121,325	1,263	884	1,624	1,671	115,883	558
1973	115,491	3,860	3,493	2,005	124,849	119,641	1,213	79	1,584	1,257	115,508	551
1974	115,586	2,923	4,732	476	123,717	117,831	1,133	25	1,558	1,137	113,978	539
1975	115,398	1,669	5,576	310	112,953	119,110	1,026	20	1,566	1,075	115,423	540
1976	120,180	1,943	3,719	124	125,966	120,257	1,004	23	1,567	1,013	116,650	540
1977	122,654	1,968	5,299	410	130,331	121,705	963	29	1,541	996	118,176	542
1978	121,461	2,310	4,916	3,710	132,397	123,668	927	51	1,497	977	120,216	545
1979	123,411	2,305	4,475	4,254	134,445	125,846	982	38	1,437	1,163	122,226	548
1980	128,525	2,109	5,419	3,180	139,233	126,274	932	56	1,395	1,067	122,824	544
1981	133,013	2,329	5,752	7,207	148,301	129,923	3,682	67	1,418	1,020	123,736	543
1982[4]	135,795	2,477	5,398	12,980	156,650	136,596	3,955	644	1,506	1,371	129,120	562

[1]Milk equivalent, fat-solids basis. [2]Includes sales for dollars and government-to-government sales. [3]Includes P.L. 480 and AID programs. [4]Preliminary.

Fluid Product Sales Lower

Sales of fluid milk, cream, and specialty products, on a product-weight basis, totaled 55.2 billion pounds in 1982, down about 222 million pounds from 1981. This small drop, coupled with a larger population, continues the decline in per capita sales of fluid milk products. Sales per person during 1982 were 240 pounds, down 3 pounds from 1981. A gain in sales of cream and specialty items only partially offset a decline in beverage milk. Moreover, the trend toward increased use of lowfat milk products continued in 1982, but at a slower rate. The gain in lowfat and skim milk in 1982 was 2.3 percent, compared with a 3.4-percent gain a year earlier.

Per Capita Consumption of American-Type Cheese Higher in 1982

Per capita civilian consumption of cheese and related processed products (including USDA donations and commerical purchases) rose substantially in 1982. Natural cheese consumption rose 0.7 pound, continuing the upward trend since 1970. Consumption of processed cheese jumped 0.8 pound, while processed foods and spreads gained 0.1 pound.

Total civilian consumption of American cheese equaled 2.6 billion pounds in 1982, a 12-percent gain. This amounted to a 1.1-pound increase per capita. USDA donations were 429 million pounds, up from 151 million a year earlier. The increased donations accounted for all of the rise in per capita consumption.

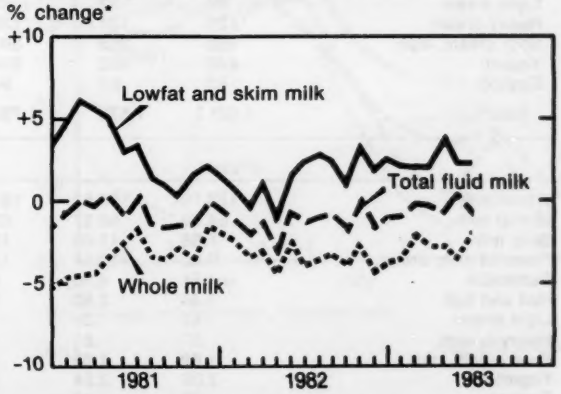
Per capita civilian consumption of cheese other than American types improved by 0.5 pound in 1982. Use of Italian-type cheese rose 0.4 pound per person, with mozzarella, the main variety, up 0.3 pound. Also contributing to the gain in consumption of cheese other than American-type was higher per capita use of Swiss, Muenster, Cream and Neufchatel, and Edam and Gouda.

Total Stocks Still Growing

Total commercial dairy stocks on July 1 were equal to 5.1 billion pounds of milk, up 103 million from a year earlier. In addition, preliminary data for August 1 indicate that stocks held by the trade increased by the equivalent of 180 million pounds of milk from July 1, 1983.

Meanwhile, Government stocks on July 1 were 18.7 billion pounds, milk-equivalent, fat-solids basis, up 2.75 billion pounds (17 percent) from a year earlier. Holdings by the Government on August 1 increased 204 million pounds from the previous month.

Daily Average Sales of Fluid Milk Items



*From year earlier. Adjusted for calendar composition.

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Neg. ERS 2705-83(9)

Table 18.—Dairy products: Per capita consumption, United States, 1970-82

Year	Fluid milk and cream[1]	Butter	Cheese: Whole and part skim milk: American	Cheese: Whole and part skim milk: Other	Cheese: Cottage cheese	Evaporated and condensed: Canned, whole milk	Evaporated and condensed: Bulk, whole milk	Evaporated and condensed: Bulk and canned, skim milk	Frozen products: Ice cream	Frozen products: Ice milk	Frozen products: Sherbet	Frozen products: Other frozen dairy products	Frozen products: Mellorine	Dry milk products: Dry whole milk	Dry milk products: Nonfat dry milk	Dry milk products: Dry buttermilk	Dry milk products: Dry whey[3]
								Pounds									
1970	277	5.3	7.1	4.4	5.2	5.9	1.2	5.0	17.6	7.8	1.6	0.2	1.2	0.2	5.3	0.2	0.9
1971	275	5.1	7.4	4.7	5.4	5.7	1.1	5.1	17.5	7.7	1.6	.2	1.1	.2	5.3	.3	1.0
1972	276	4.9	7.8	5.3	5.5	5.1	1.2	4.7	17.3	7.7	1.6	.3	1.1	.1	4.6	.2	1.7
1973	272	4.8	7.9	5.7	5.3	4.8	1.1	4.3	17.3	7.6	1.6	.3	.9	.1	5.3	.2	1.8
1974	262	4.5	8.6	6.0	4.7	4.4	1.2	3.5	17.4	7.7	1.5	.3	.8	.1	4.2	.2	2.0
1975	267	4.7	8.2	6.1	4.7	3.9	1.4	3.6	18.5	7.7	1.5	.3	.7	.1	3.3	.2	2.2
1976	264	4.3	9.0	6.7	4.7	3.7	1.3	3.6	17.9	7.3	1.5	.3	.5	.2	3.5	.2	2.4
1977	260	4.3	9.3	6.8	4.7	3.2	1.1	3.9	17.5	7.8	1.5	.3	.4	.2	3.3	.3	2.4
1978	257	4.4	9.6	7.4	4.7	3.1	1.1	3.5	17.4	7.7	1.4	.4	.4	.3	3.1	.2	2.5
1979	253	4.5	9.6	7.6	4.5	3.0	1.1	3.4	17.1	7.3	1.3	.3	.3	.3	3.3	.2	2.7
1980	250	4.5	9.7	7.9	4.5	2.8	1.0	3.3	17.3	7.2	1.3	.3	.3	.3	3.0	.2	2.7
1981	246	4.3	10.3	8.1	4.4	2.9	1.2	3.2	17.2	7.0	1.3	.6	.2	.2	2.6	.2	2.8
1982[4]	242	4.5	11.4	8.6	4.2	2.8	1.3	3.0	17.5	6.7	1.2	.7	.2	.1	2.7	.2	2.9

[1]Product pounds of commercial sales and on farm consumption. Commercial sales includes whole milk, lowfat milk, skim milk, buttermilk, flavored milk and drinks, cream, milk-cream mixtures, sour cream and dips, eggnog and yogurt. [2]Excludes cottage cheese. [3]Includes modified dry whey products beginning 1975. [4]Preliminary.

Table 19.—Sales of selected dairy products, total and per capita, 1975-82

Item	1975	1976	1977	1978	1979	1980	1981[1]	1982[1]
				Million pounds				
Beverages:								
Whole milk	36,924	35,669	34,300	33,634	32,780	31,745	30,806	30,095
Lowfat milk	11,703	12,622	13,573	14,458	15,237	16,203	16,900	17,429
Skim milk	2,529	2,555	2,639	2,576	2,631	2,673	2,621	2,534
Flavored milk, drinks	2,123	2,364	2,525	2,484	2,385	2,313	2,295	2,197
Buttermilk	1,032	1,035	1,016	996	950	941	893	934
Total[2, 3]	54,367	54,290	54,093	54,185	54,017	53,908	53,546	53,217
Cream and specialty products:								
Half and half	525	538	541	544	550	562	576	588
Light cream	89	77	68	71	67	55	55	62
Heavy cream	121	131	128	124	140	149	156	164
Sour cream, dips	358	355	367	380	399	415	429	462
Yogurt	445	482	534	565	567	589	582	624
Eggnog	82	87	94	95	94	95	100	105
Total[3]	1,621	1,670	1,732	1,780	1,817	1,865	1,898	2,005
				Pounds per capita[4]				
Whole milk	173.19	165.52	157.41	152.61	146.93	140.59	135.11	130.68
Lowfat milk	54.89	58.57	62.29	65.60	68.30	71.76	74.12	75.68
Skim milk	11.86	11.86	12.11	11.69	11.79	11.84	11.50	11.00
Flavored milk, drinks	9.96	10.97	11.59	11.27	10.69	10.24	10.07	9.54
Buttermilk	4.84	4.80	4.66	4.52	4.26	4.17	3.92	4.06
Half and half	2.46	2.50	2.48	2.47	2.47	2.49	2.53	2.55
Light cream	.42	.36	.31	.32	.30	.24	.24	.27
Heavy cream	.57	.61	.59	.56	.63	.66	.68	.71
Sour cream, dips	1.68	1.65	1.68	1.72	1.79	1.84	1.88	2.01
Yogurt	2.09	2.24	2.45	2.57	2.54	2.61	2.55	2.71
Eggnog	.38	.40	.43	.43	.42	.42	.44	.46

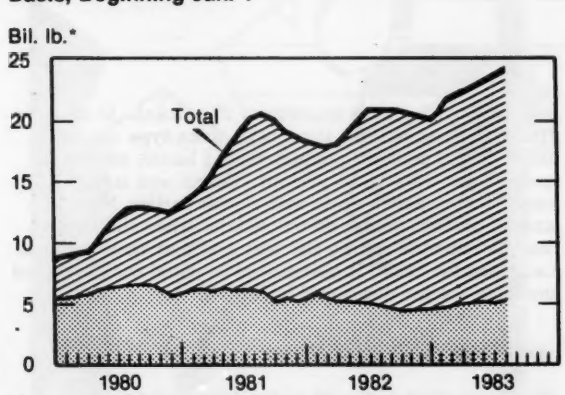
[1]Preliminary. [2]Total includes filled and imitation milk. [3]Total may not add due to rounding. [4]Based on estimated population using fluid products from purchased sources.

Table 20.—Sales and civilian consumption of American and other cheese, 1970-82

Year and cheese	Sales[1]			USDA donations			Civilian consumption	Per capita	
	Civilian	Military	Total	Civilian	Military	Total		Sales	Civilian consumption
	Million pounds							*Pounds*	
American cheese									
1970	1,385	8	1,393	46	—	46	1,431	6.8	7.1
1971	1,445	7	1,452	75	—	75	1,520	7.0	7.4
1972	1,568	5	1,573	46	—	46	1,614	7.5	7.8
1973	1,657	4	1,661	4	—	4	1,661	7.9	7.9
1974	1,768	3	1,771	43	—	43	1,811	8.3	8.6
1975	1,689	3	1,692	73	—	73	1,762	7.9	8.2
1976	1,913	4	1,917	25	—	25	1,938	8.8	9.0
1977	1,909	7	1,916	117	—	117	2,026	8.7	9.3
1978	2,046	9	2,055	70	—	70	2,116	9.3	9.6
1979	2,101	21	2,122	42	—	42	2,143	9.4	9.6
1980	2,002	14	2,016	179	2	181	2,183	8.9	9.7
1981	2,191	10	2,201	151	1	152	2,343	9.6	10.2
1982[2]	2,194	13	2,207	429	3	432	2,626	9.5	11.4
Other cheese									
1970	886	6	892	—	—	—	886	4.4	4.4
1971	966	5	971	—	—	—	966	4.7	4.7
1972	1,105	5	1,110	—	—	—	1,105	5.3	5.3
1973	1,188	5	1,193	—	—	—	1,188	5.6	5.7
1974	1,260	7	1,267	—	—	—	1,260	5.9	6.0
1975	1,310	7	1,317	—	—	—	1,310	6.1	6.1
1976	1,438	3	1,441	—	—	—	1,438	6.6	6.7
1977	1,487	2	1,489	—	—	—	1,487	6.8	6.8
1978	1,621	2	1,623	—	—	—	1,621	7.3	7.4
1979	1,695	3	1,698	—	—	—	1,695	7.6	7.6
1980	1,793	2	1,795	—	—	—	1,793	7.9	7.9
1981	1,839	2	1,841	—	—	—	1,839	8.0	8.1
1982[2]	1,988	2	1,990	—	—	—	1,988	8.6	8.6

[1]Domestic disappearance, commercial sources. [2]Preliminary.

Dairy Product Stocks:[O] Milk Equivalent Fat Solids Basis, Beginning Jan. 1



[O]As of first of month. *Milk equivalent, fat-solids basis.

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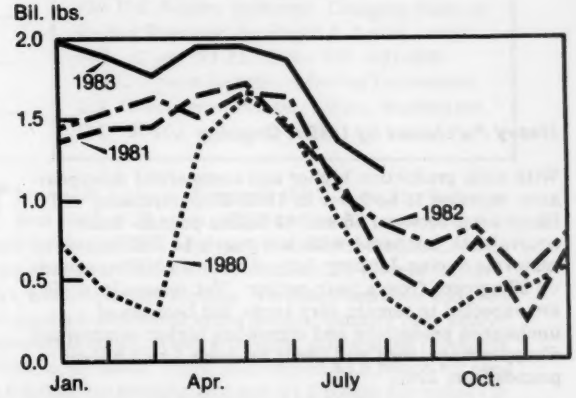
USDA Dairy Product Purchases*



*Net removals, milk equivalent, fat-solids basis.

USDA

Neg. ERS 8449-83(9)

Table 21.—Per capita civilian consumption of selected cheese varieties, 1970-82

Year	Natural equivalent of cheese and cheese products												
	American			Italian							Miscellaneous		
	Cheddar	Other[1]	Total	Provolone	Romano	Parmesan	Mozzarella	Ricotta	Other	Total	Swiss[2]	Brick	Muenster
	Pounds												
1970	5.9	1.2	7.1	.23	.15	.17	1.21	.25	.08	2.09	.90	.10	.17
1971	6.0	1.4	7.4	.22	.15	.20	1.40	.28	.07	2.31	.95	.11	.19
1972	6.1	1.7	7.8	.24	.17	.23	1.59	.32	.08	2.63	1.08	.11	.22
1973	6.2	1.8	7.9	.27	.16	.19	1.79	.34	.09	2.84	1.08	.11	.22
1974	6.4	2.2	8.6	.28	.15	.25	1.88	.34	.09	2.99	1.21	.11	.23
1975	6.1	2.1	8.2	.28	.23	.17	2.14	.38	.07	3.27	1.11	.09	.24
1976	6.5	2.5	9.0	.32	.17	.28	2.34	.41	.08	3.60	1.26	.09	.26
1977	6.9	2.4	9.3	.35	.16	.27	2.49	.41	.09	3.77	1.22	.07	.25
1978	7.0	2.6	9.6	.37	.19	.28	2.72	.45	.11	4.12	1.35	.08	.27
1979	7.0	2.6	9.6	.41	.16	.32	2.84	.47	.08	4.28	1.36	.06	.29
1980	6.9	2.8	9.7	.42	.15	.28	3.05	.47	.10	4.47	1.34	.07	.31
1981	7.2	3.1	10.3	.45	.14	.31	3.01	.50	.09	4.50	1.28	.06	.30
1982[3]	8.7	2.7	11.4	.47	.17	.33	3.32	.48	.12	4.89	1.31	.06	.31

Year	Natural equivalent—continued					Total	Product-weight form				
	Miscellaneous—continued						Processed				
	Cream and Neufchatel	Blue[4]	Edam and Gouda	Other	Total		Cheese	Foods and spreads	Total	Natural	Total[5]
						Pounds					
1970						0.63					
1971	.64	.15	.10	.26	2.40	12.1	3.6	2.3	5.9	7.5	13.4
1972	.65	.16	.11	.37	2.70	13.1	3.4	2.7	6.0	8.2	14.2
1973	.67	.17	.12	.46	2.83	13.6	3.3	2.7	6.0	8.9	14.9
1974	.72	.16	.11	.42	2.96	14.6	3.4	2.9	6.4	9.5	15.9
1975	.75	.15	.11	.41	2.86	14.3	3.3	3.4	6.7	9.2	15.9
1976	.78	.18	.11	.40	3.08	15.7	3.8	2.6	6.5	10.5	17.0
1977	.81	.17	.11	.44	3.07	16.1	3.8	3.3	7.1	10.6	17.7
1978	.90	.19	.12	.34	3.25	17.0	3.7	3.3	7.0	11.5	18.5
1979	.95	.17	.13	.38	3.34	17.2	3.7	3.1	6.8	11.9	18.7
1980	1.01	.17	.13	.45	3.48	17.6	3.8	3.1	7.0	12.2	19.2
1981	1.06	.16	.12	.60	3.58	18.4	3.6	3.2	6.7	13.2	19.9
1982[3]	1.14	.16	.14	.64	3.76	20.1	4.4	3.3	7.7	13.9	21.6

[1]Includes colby, washed curd, stirred curd, Monterey, and jack. [2]Includes imports of Gruyere and Emmenthaler. [3]Preliminary. [4]Includes Gorgonzola. [5]Total product-weight is greater than natural equivalent because processed cheese and cheese food is made from natural cheese and other dairy products. Numbers may not add due to rounding.

Heavy Purchases by USDA Ongoing

With milk production higher and commercial disappearance expected to be lower in 1983, CCC purchases will likely total between 16 and 18 billion pounds (milk-equivalent), compared with last year's 14.3 billion. Net removals during January-August were 14 billion pounds, up 22 percent from a year earlier. Net removals in 1984 are expected to remain very large, but because of unchanged production and somewhat higher commercial disappearance, they will likely be down 1 to 3 billion pounds from 1983.

FOREIGN TRADE AND TRENDS

Imports Up Sharply

Imports of dairy products in the first half of 1983, on a milk-equivalent, fat-solids basis, rose 19 percent from last year, with cheese imports up 22 percent. During the first 6 months of 1983, imports of quota-type cheese increased 19 percent (product-weight basis), while non-quota types were up 35 percent. Casein and lactose imports were about equal with a year earlier. Note that annual product quotas do not restrict when the product may be imported during the year and that they were not increased for 1983. It also should be noted that imported products are not purchased by USDA.

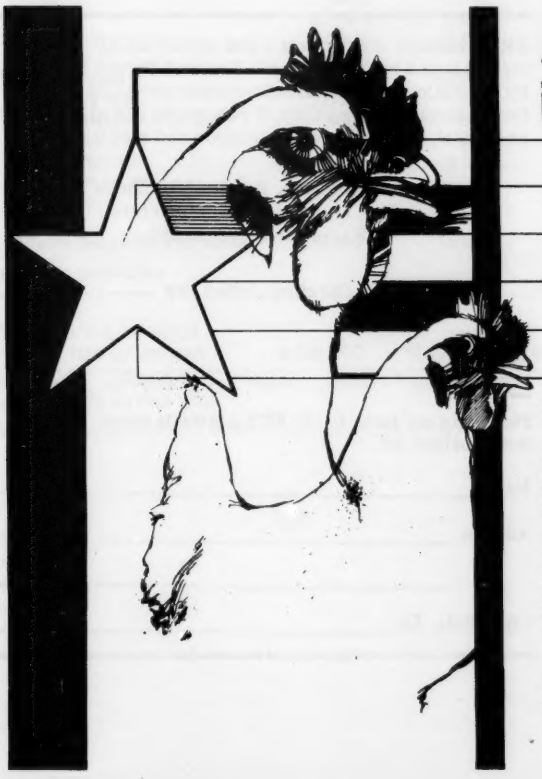
World Milk Production Higher

Milk production in the 36 major dairy countries is expected to approach 401 million metric tons in 1983, a little over 3 percent (about 12 million metric tons) above 1982. Most of the gains in 1983 are expected in the Soviet Union (5 million metric tons) and the European Community (4 million metric tons). The initial forecast for 1984 indicates total production may be up 1 percent.

Table 22.—Sales of individual fluid products as percent of average daily fluid milk sales, all Federal order markets, 1970, 1975-82[1]

Fluid items	1970	1975	1976	1977	1978	1979	1980	1981	1982
					Percent				
Whole milk[2]	76.1	65.6	63.4	61.1	59.8	58.4	56.7	55.6	54.7
Flavored whole milk[3]	2.5	2.6	2.7	2.7	2.5	2.3	2.0	1.5	1.4
Total whole milk	78.6	68.2	66.1	63.8	62.3	60.7	58.7	57.1	56.0
Lowfat milk[4]	12.1	21.4	22.8	24.4	26.0	27.5	29.1	30.5	31.5
Plain	3.3	11.6	14.3	15.8	18.0	20.7	22.8	25.2	26.5
Solids added	8.8	9.8	8.5	8.6	8.0	6.8	6.3	5.4	5.1
Skim milk	4.3	4.2	4.3	4.5	4.4	4.5	4.6	4.5	4.4
Plain	1.1	1.7	1.9	2.1	2.3	2.7	2.9	3.3	3.4
Solids added	3.2	2.5	2.4	2.4	2.1	1.8	1.7	1.2	1.0
Buttermilk	1.9	1.8	1.8	1.8	1.7	1.6	1.6	1.6	1.8
Yogurt	.3	.7	.8	1.0	1.0	.9	.9	1.0	1.0
Flavored milk drinks	.8	1.5	2.0	2.4	2.4	2.5	2.7	2.9	2.8
Total skim and lowfat items	19.4	29.6	31.7	34.1	35.5	37.0	38.9	40.5	41.5
Milk and cream mixtures	1.1	.9	.9	1.0	.9	1.0	1.0	1.0	1.0
Light cream	.2	.2	.2	.1	.2	.1.	.1	.1	.1
Heavy cream	.2	.2	.2	.2	.2	.2	.3	.3	.3
Sour cream	.4	.6	.6	.7	.7	.7	.7	.7	.8
Total cream items	.8	1.0	1.0	1.0	1.1	1.0	1.1	1.1	1.2
Eggnog	.2	.2	.2	.2	.2	.2	.2	.2	.2
Total fluid milk and cream[5]	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

[1]Total packaged disposition in and out of the marketing area, by regulated handlers. [2]Includes whole milk equivalent of small quantity of concentrated milk. [3]Includes small amount of flavored milk drinks. [4]Includes 1 percent lowfat milk. [5]Totals may not add due to rounding.



Advances Made in the Poultry Industry

The U.S. Poultry Industry: Changing Economics and Structure, by Floyd A. Lasley. AER-502. 32 pp. $3.25. Order SN: 001-000-04342-1 from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

This report looks at changes in the U.S. poultry industry over the last 25 years. While per capita consumption of poultry meat in 1981 has nearly doubled since 1960, retail prices rose only 74 percent for broilers, 67 percent for turkeys, and 59 percent for eggs. Vertical integration and technological advancements in the poultry industry have vastly improved production and efficiency, and enabled producers to hold costs down. Farm sales totaled $3.6 billion for eggs, $4.5 billion for broilers, and over $1.2 billion for turkeys in 1981, up from about $2 billion for eggs, $533 million for broilers and $270 million for turkeys during the early fifties. Consumers paid only 86 percent more for poultry in 1981 than they did in 1960, compared with a 212-percent increase for all food.

Table 23.—Dairy product stocks, July 1, 1981-83

Item	1981	1982	1983
	Million pounds		
Commercial:			
Butter	40.9	26.5	30.1
American cheese	425.4	365.6	367.4
Other cheese	100.8	91.6	101.9
Nonfat dry milk	116.3	127.5	91.2
Milkfat	208.4	177.4	181.9
Solids-not-fat	288.1	284.4	247.8
Milk-equivalent, fat-solids basis	5,921.0	5,041.8	5,145.1
Government:			
Butter	466.6	515.1	558.5
American cheese[1]	159.5	346.7	674.5
Nonfat dry milk	616.8	1,004.9	1,309.7
Milkfat	505.2	587.7	683.3
Solids-not-fat	717.5	1,132.4	1,483.6
Milk-equivalent, fat-solids basis[1]	13,612.6	15,948.5	18,701.8

[1]Does not include processed American cheese stocks held by CCC.

Table 24.—USDA dairy purchases, with comparisons[1]

Item	January-August		
	1982	1983	Change
	Million pounds		*Percent*
Butter	325.5	361.7	+11.1
American cheese	475.9	654.1	+37.4
Nonfat dry milk	715.2	810.0	+13.3
Evaporated milk	13.2	14.1	+6.8
Milk-equivalent, fat-solids basis	11,450.9	13,961.1	+21.9

[1]Deliveries minus unrestricted sales.

Table 25.—Uncommitted CCC stocks, selected dates, 1981-83

Date	Butter	American cheese	Nonfat dry milk
June 1, 1981	411.0	439.0	641.2
Oct. 1, 1981	216.5	554.4	811.1
Feb. 1, 1982	250.4	547.4	902.2
June 1, 1982	427.6	695.5	1,053.0
Oct. 1, 1982	402.7	825.1	1,177.1
Feb. 1, 1983	413.4	771.9	1,285.2
June 1, 1983	470.3	790.4	1,253.6
Sept. 1, 1983	457.5	1,020.3	1,348.8

Table 26.—U.S. dairy trade, milk-equivalent, fat-solids basis, 1980-83

Year and quarters	Imports		Exports	Shipments[1]
	Cheese	Other		
	Million pounds			
1980				
1st	224	142	108	135
2nd	321	36	88	139
3rd	489	18	75	142
4th	832	47	99	146
Year[2]	1,866	243	370	562
1981				
1st	306	98	85	162
2nd	393	77	528	138
3rd	451	127	706	155
4th	809	68	1,777	131
Year[2]	1,960	370	3,096	586
1982				
1st	359	62	1,558	153
2nd	439	126	938	157
3rd	538	43	592	129
4th	792	117	846	163
Year[2]	2,128	348	3,935	602
1983				
1st	512	121	500	152
2nd	493	45	870	157

[1]To U.S. territories. [2]May not add because of rounding.

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Table 27.—Dairy products: U.S. imports, quota and non-quota, total 1982 and January-June, 1982-83[1]

Product	Calendar year quota	1982 imports	June			Cumulative, January-June		
			1982	1983	1983 as a % of 1982	1982	1983	1983 as a % of 1982
	Thousand pounds				*Percent*	*Thousand pounds*		*Percent*
Cheese, quota types								
American								
-cheddar	12,205.3	[4]12,682	2,018	154	8	4,624	3,815	82
-other	7,545.4	5,163	268	166	62	1,095	3,858	352
Italian								
-original loaves	12,374.4	12,139	1,397	928	66	4,581	5,985	131
-Other	1,550.0	1,436	342	70	20	649	588	91
Edam and Gouda								
-natural	9,208.6	8,459	502	456	91	4,628	3,911	84
-processed	3,151.3	2,955	144	192	133	724	663	92
Blue mold	5,469.6	5,096	390	368	94	1,967	3,196	162
Swiss								
-Emmenthaler	70,278.1	67,193	5,763	4,607	80	30,730	31,494	102
-Gruyere process	16,479.0	14,848	887	1,199	135	4,558	7,301	160
Other								
-over 0.5% fat	89,466.8	87,996	4,500	4,071	90	26,597	37,963	143
-under 0.5% fat	12,621.1	12,249	1,006	487	48	6,405	4,665	73
Total	240,349.6	230,216	17,216	12,698	74	86,558	103,440	119
Cheese, nonquota types								
Other cow's milk cheeses[2]		14,724	1,112	1,320	118	6,001	7,971	133
Miscellaneous[3]		1,201	46	43	93	548	608	111
Pecorino		22,291	2,092	2,464	118	9,231	12,871	139
Roquefort		910	154	85	55	422	461	109
Total		39,127	3,404	3,912	115	16,201	21,911	135
Total cheese, Quota and Nonquota	240,349.6	269,343	20,621	16,610	81	102,759	125,351	122
Other quota products								
Butter	707.0	[4]1,746	172	152	88	[4]904	[4]742	82
Butteroil	1,200.0	1,200	0	0	0	1,200	1,200	100
Butterfat mixtures	2,580.0	2,335	33	0	[5]	87	23	26
Ice cream	3,377.3	0	0	0	0	0	0	0
Frozen cream	12,540.0	[4]15,133	931	75	8	8,646	7,101	82
Nonfat dry milk	1,807.0	[4]1,935	136	331	243	903	1,048	116
Dried buttermilk and whey	496.0	355	0	0	0	9	0	[5]
Evaporated milk	1,312.0	[4]4,036	338	663	196	[4]2,148	[4]2,929	136
Condensed milk	4,079.0	3,129	0	1	(6)	1,783	580	33
Chocolate crumb								
-regular	21,409.2	18,825	3,697	2,307	62	8,155	7,840	96
-lowfat	4,680.0	740	320	102	32	440	624	142
Animal feed with milk solids	16,300.0	15,948	1,057	2,015	191	2,397	5,748	240
Non-quota products								
Casein		176,752	18,479	13,600	74	76,214	75,605	99
Lactose		1,050	59	89	151	521	497	95
Milk equivalent, fat solids basis, total all proucts	2,234,270	[4]2,476,760	191,386	145,050	76	986,746	1,171,032	119

[1]Preliminary. s6[2]Primarily soft, ripened cheeses. [3]Gjetost, Bryndza, Gammelost and Noekkelost, and Goya. [4]Probable error in reported data. [5]Less than 1. [6]More than 1,000.

SOURCE: U.S. Department of Commerce, Bureau of the Census.

Impact of Ultra-High Temperature Milk on the U.S. Dairy Industry[1]

James J. Miller[2]

Abstract: Milk pasteurized by "ultra-high temperature" (UHT) methods and packaged aseptically would eliminate perishability as a primary characteristic of fluid milk. Relative costs of processing, distributing, and retailing were estimated using economic engineering, linear programing, and simulation techniques. Costs of UHT containers were sharply higher, but other processing and distribution costs were similar to those for traditional fluid products. Retailing costs for UHT were somewhat lower. Equilibrium retail UHT prices ranged from 3 to 12 percent higher. Adoption of UHT technology was not found to substantially affect the costs of handling supply-demand variability for fluid milk.

Keywords: Milk, "ultra-high temperature", processing costs, distribution costs, retailing costs, supply-demand variability.

Milk sterilized by means of "ultra-high temperature" (UHT) pasteurization and packaged aseptically is a potentially revolutionary product. It already has captured a major share of the fluid milk market in many European countries. The most important characteristic of UHT milk is that it can be stored at room temperature for up to 6 months. Rolling inventories of UHT milk would provide an alternative mechanism to handling inherent variability in the fluid market with reserves of raw milk.

UHT milk is a close—but not perfect—substitute for milk pasteurized by the current "high temperature-short time" (HTST) method. According to taste panels, the flavor of UHT milk is slightly inferior and the variation in flavor is more pronounced. Nutritional degradation is minor, approximately the same as with HTST treatment. On the other hand, storability is a definite asset for recreational use and for reserve supplies in the home. Small markets for specialty products (such as lactose-reduced or exotic flavored milks) and the vending machine market can be served better and (potentially) more profitably by UHT milk. However, sales of UHT in this country are not likely to be as important as in some European countries where lower-quality HTST products or limited refrigeration in the home boosted UHT sales.

The study evaluated processing costs, the impact of UHT on the need for seasonal and daily reserves of raw milk, distribution costs and specialization of plants, costs of retailing, and the relative prices resulting from alternative classification under Federal orders. Results from prior economic engineering studies, linear and simulation techniques were used to project relative costs after complete adjustment to UHT milk. Costs and processor behavior during the adjustment process would be substantially different from the results presented here.

[1]Based on a forthcoming report with the same title.

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Seasonality of Production

The seasonal pattern of UHT production need not be tied to the seasonality of sales (which was assumed to be the same as for HTST). More even seasonal output offers cost savings to the processor by reducing the fixed cost of required processing capacity. Additional savings would accrue by processing less during the winter—when raw milk prices are high. These savings can only be attained by incurring additional storage costs, including interest charges and fixed investment costs for storage space. (Other variable costs of storage do not apply because UHT is generally stored for 10 days to improve flavor.)

The seasonal production pattern which minimized costs to the processor varied considerably among regions because of divergent seasonality of sales. However, the differences were primarily ones of timing and magnitude. Production was increased to a fall-winter plateau 2 to 5 months before the demand peak and remained there until sales fell below that level. Stocks rose during the first portion of this period and then fell, although some deviation occurred because of the holiday-induced drop in sales during December. During spring and summer, only enough was produced to meet current sales; it was less costly to carry excess capacity than stocks for the tight season. Ironically, the indicated seasonal reserves of raw milk were as large as or larger than for HTST.

The results for the East North Central region illustrate the general pattern. Daily average sales in these Federal order markets hit a July seasonal low of 91 percent of the annual average and then increased to a peak of 106 percent in January. UHT production equaled sales during April-August. Production jumped to 103 percent in September and continued at full capacity through March. Stocks of UHT milk rose slowly during September-November, absorbed all of the December drop in sales, and then were used to meet heavy January-February sales. The peak amount of seasonal milk surplus in June was the same as for HTST production but production ran about one-half percent higher during November—the month with tightest milk supplies.

Not surprisingly, the model did not indicate storage simply because of seasonal price rises. Average seasonal rises in raw milk prices are ultimately defined by costs of storing manufactured products. Storage costs are less for manufactured products than for UHT (per cwt of raw milk) because of much lower interest charges.

The optimal pattern of production and stocks was very insensitive to changes in interest rates and the cost ratio of processing to storage capacity. As processing capacity is reduced, cost savings rise in a roughly linear manner, while variable and fixed costs of storage rise at a rapidly increasing rate—resulting in the observed stability. Reductions in processing capacity were largest in regions with the sharpest seasonal demand peaks.

Slack UHT capacity during the peak surplus months could be used to reduce the costs of manufacturing the seasonal surplus. The pattern of UHT output which minimized costs for the entire market was the one having the greatest difference between reductions in manufacturing costs (net of changes in producer revenues) and increases in costs to UHT processors. This pattern of production could be expected in a UHT plant owned by a balancing cooperative or where the cooperative could negotiate arrangements with processors.

With such incentive, UHT processors would help trim the peak surplus and reduce resulting stocks as quickly as possible. However, processing capacity was reduced in most regions because these stocks could not be worked off before seasonal building of stocks. The net savings to the market were small, ranging from 0.4 cent per cwt of milk delivered to the UHT market in the North Atlantic to 1.8 cents in the East North Central.

A UHT firm could develop a network of independent milk producers whose annual output equaled its annual sales. Such a processor would be independent of cooperative balancing services and over-order payments. Processing UHT according to the seasonality of milk production would raise costs per cwt processed between 7.3

Table I.—An example of seasonal UHT production and stocks: East North Central region

Month	Sales	Base		Market optimum		Independent supply	
		Processed	Stocks[1]	Processed	Stocks[1]	Processed	Stocks[1]
	Av. monthly sales = 100						
January	106.3	103.1	1.4	102.2	3.1	95.9	7.9
February	104.5	103.1	—	102.2	.9	98.5	1.9
March	103.1	103.1	—	102.2	—	101.2	—
April	101.5	101.5	—	101.5	—	104.8	3.2
May	98.6	98.6	—	99.0	.4	108.5	13.1
June	92.8	92.8	—	99.6	7.2	108.5	28.7
July	90.8	90.8	—	88.7	5.2	102.8	40.8
August	94.4	94.4	—	95.4	6.2	100.4	46.8
September	102.6	103.1	.5	102.2	5.8	97.4	41.6
October	102.7	103.1	.9	102.2	5.3	95.0	33.9
November	102.7	103.1	1.4	102.2	4.9	92.9	24.1
December	100.0	103.1	4.5	102.2	7.2	94.1	18.3
Total[2]	1200.0	1200.0	8.7	1200.0	46.2	1200.0	260.3
Capacity[3]	106.3	103.1	4.5	102.2	7.2	108.5	46.8

[1]At end of month. [2]May not add due to rounding. [3]Needed capacity defined as maximum in any month.

Table II.—Impacts of alternative UHT seasonal processing schedules

Region	Market Optimum				Independent supply				
	Change[1] in:				Change[1] in:				
	Processor cost	Producer revenue	Balancing cost	Net Savings[2]	Processor cost	Producer revenue	Balancing cost	Net Savings[2]	Change in processor cost[1]
	¢/cwt delivered to UHT market[3]								*¢/cwt UHT sold*
North Atlantic	(4)	(5)	−.5	+.4	+9.3	−.7	−3.8	−6.2	+18.1
South Atlantic	+.4	+.1	−.9	+.6	+6.8	+.1	−2.3	−4.4	+8.0
East North Central	+.3	−.2	−2.2	+1.8	+9.0	−1.0	−5.4	−4.7	+19.1
West North Central	+1.2	−.2	−2.5	+1.1	+8.2	−.5	−4.7	−4.0	+22.6
East South Central	+.3	−.1	−2.0	+1.6	+5.3	−.5	−3.4	−2.4	+7.3
West South Central	+.2	+.2	−.8	+.7	+12.6	−.2	−3.5	−9.3	+16.3
Mountain	+.5	−.1	−2.3	+1.8	+7.6	−1.2	−4.8	−4.0	+15.9
Pacific	+.6	−.2	−2.4	+1.6	+7.7	−1.1	−4.8	−3.9	+15.9

[1]From Base solution. [2]To all market participants (does not include any loss of over-order revenue); May not add due to rounding. [3]Total market deliveries times market share of UHT. [4]Positive but less than .05¢. [5]Negative but absolute value less than .05¢.

Table III.—HTST and UHT processing costs by plant size

Plant capacity[1]	50,000	200,000	400,000	65,625	150,940	301,875	603,750	Combined[2]
	HTST			*UHT*				
	¢/gal							
Fixed cost at full capacity	11.6	6.6	5.0	13.3	11.2	9.1	7.9	9.5
Average fixed cost[3]	12.3	7.0	5.3	13.8	11.6	9.5	8.1	9.9
Variable cost[4]	24.3	21.9	21.3	44.6	43.6	42.8	41.6	44.4
Seasonal storage cost[5]	—	—	—	.1	.1	.1	.1	.1
Total[6]	36.6	28.9	26.6	58.5	55.2	52.3	49.8	54.4

[1]Gallons per week. [2]Capacity for 65,000 gallons of UHT and 235,000 gallons of HTST. [3]Based on U.S. average capacity utilization rates of 94.3% for HTST and 96.6% for UHT. [4]Includes U.S. average cost of operating capital. [5]U.S. average; includes both fixed and variable costs. [6]May not add due to rounding.

cents (in the East South Central) and 22.6 cents (in the West North Central). Cost increases were greatest in northern markets, followed by western markets. End-of-month stocks could be rotated within no more than 16 days—presenting no significant technical or flavor problems. Costs of manufacturing the surplus were reduced substantially without a seasonal surplus from the UHT market. However, the net loss to all market participants ranged from 2.4 cents per cwt delivered in the East South Central region to 9.3 cents in the West South Central.

Daily Production

Some types of capacity (receiving facilities, for example) in a plant producing both UHT and HTST would be determined by the maximum combined daily volume. Costs of this joint capacity could be reduced if UHT production were higher on days with lower HTST output—but at the cost of larger specialized UHT capacity. The results showed that it generally was less costly to operate UHT equipment at constant daily quantities and carry excess joint capacity. Reduced UHT output was indicated only for the day of the month with peak HTST production. Cost savings for the plant were quite small—about a half cent or less per cwt.

Needed operating reserves would be smaller for UHT than for HTST milk because of the constant daily UHT production. However, it is unlikely that UHT production would do much to help balance the HTST market. Some accommodation could be made during periods of seasonal slack capacity.

Distribution Costs and Specialization

Costs of operating a given distribution route are determined by length and the number of stops; the quantity carried generally has very little impact. Therefore, costs of delivering UHT on HTST routes would be substantially cheaper than maintaining separate UHT and HTST delivery systems. Unless UHT milk dominated the fluid market, frequency of deliveries of HTST (and therefore total costs of the combined delivery system) would be largely unaffected.

Large plants could either specialize in one type or process both products. Some processing costs are reduced by specialization, but each specialized plant must distribute over a larger geographic area. Even though specialization lowered average processing costs by about 0.6 cent per gallon, specialized plants had an advantage only where consumption density was very high and backhauls on HTST or grocery chain routes were used. In general, costs for either system would be about the same.

Table IV.—Retail costs of UHT and HTST

Item	HTST	UHT	Savings
		¢/gal.[1]	
Direct variable cost			
Unloading	.8	.1	.7
Backroom movement	.8	.1	.7
Movement to selling area	.1	.1	0
Opening cases	0	.6	−.6
Marking prices	.5	.6	−.1
Shelving	1.6	1.2	.3
Disposal of shipping material	1.4	1.1	.3
Checkout	3.1	3.1	0
Other	.5	.5	0
Total[2]	8.7	7.4	1.3
Cost of facilities			
Utilities	1.0	.1	.9
Depreciation	1.0	.3	.7
Other building cost	.5	.4	.1
Equipment repair	.5	.1	.4
Insurance, equipment rental, and taxes	.3	.1	.2
Total[2]	3.3	1.0	2.3
Total retail cost[3]	12.0	8.4	3.6

[1]Weighted averages of 1/2 gallon and gallon sizes. [2]May not add due to rounding. [3]Does not include interest on operating capital and some overhead costs.

Costs of Retailing

Retailers could dispense with refrigeration and merchandise UHT milk more simply as a dry grocery item. Significant cost savings were found. Elimination of refrigeration reduced the costs of equipment, buildings, and utilities by 2.3 cents per gallon. An additional net savings of 1.3 cents per gallon in direct variable costs was attained. The use of pallets and flexibility in backroom handling for UHT were primary sources of these savings.

Relative Costs and Prices

If UHT milk captures a market share of less than one-fourth, costs of processing and distributing would be

about 27 cents per gallon higher than for HTST. Equal market shares would lower this difference by about 2 cents. In any case, the difference in cost roughly equals the difference in costs of packaging materials. Part of the higher costs to the processor would be offset by the 4-cents-per-gallon savings in retailing costs.

Classification of milk used in UHT products in Federal order markets will have a major impact on relative retail prices. If milk for UHT is put in Class I (as is milk for HTST) and all cost differences are reflected in retail prices, the per-gallon retail price of UHT milk would be about 23 cents higher than that of HTST milk. This difference would be essentially uniform across regions. If milk for UHT were assigned to the manufacturing class (Class III in most markets), UHT prices would average 5 cents per gallon higher. However, the price difference would be considerably smaller in the South than in the Upper Midwest. Prices for UHT would be the same as for HTST in the South Atlantic region, but 11 cents higher in the West North Central. If prices of milk for UHT were not regulated, processors would have to pay a price close to the Federal order blend price to attract enough milk. In this case, UHT would be most price-competitive in the North Atlantic region (13 cents higher than HTST) and least competitive in the South Atlantic (20 cents higher). The average price difference would be 15 cents per gallon.

UHT Milk in the Immediate Future

The situation faced by the three plants currently producing UHT (in Washington, California, and Georgia) differs greatly from the situation analyzed above. In particular, the costs of distribution and processing are much higher than they would be in the longer run. Pricing and promotion strategies will have a strong influence on the number of consumers making trial purchases. During this early phase, quality control is both difficult and crucial. Meanwhile, the quantity sold, costs, and prices are highly interdependent. Brisk sales would lower costs and prices—spurring even larger sales and broader adoption of the technology. By the same token, failure to generate sufficient early volumes would delay greatly the adjustment process or doom the product entirely.

The fate of UHT milk is uncertain at this stage. It has been introduced in quite a few markets already but has not been available long enough to gauge consumer acceptance. Sizable specialty markets where UHT has consumer advantages probably exist, but these markets may not be large enough to bring costs down to profitable levels. Without a breakthrough in packaging costs, UHT is not likely to significantly challenge the core HTST market. Even if UHT proves viable, adoption probably would be slow because of large per-unit investment, large minimum size of operation, and quite modest potential cost savings elsewhere in the system.

Table V.—Equilibrium retail prices, by region and policy option

Region	Retail price of HTST	Retail price of UHT		
		Classification as Class I[1]	Classification as Class III[1]	Unregulated[1]
	Cents per gallon			
U.S.	198.7	221.9	203.8	213.3
North Atlantic	202.0	225.2	203.8	214.8
South Atlantic	204.1	227.4	204.0	224.0
East North Central	194.1	217.2	203.8	210.1
West North Central	193.0	216.2	203.8	208.3
East South Central	198.0	221.2	204.0	216.7
West South Central	201.0	224.1	203.7	219.5
Mountain	199.9	223.1	203.8	216.8
Pacific	197.1	220.2	203.8	211.7

[1]Refers to classification of milk for UHT in Federal order markets.

A Longrun Look at Margins and Productivity in Fluid Milk Processing

James J. Miller[1]

Abstract: Analysis of data on margins in fluid milk processing showed strong productivity gains since 1961. Gross margins grew substantially slower than the average of all food industries. Productivity advances during 1961-72 were accomplished largely by the substitution of capital for labor. This left the industry with excess capacity and low net margins. Since 1972, productivity of both labor and capital has been boosted by pervasive improvements that individually were not of major importance. However, the aggregate effect has been substantial declines in real gross margins, improved net margins, lower real retail prices, and expanded demand for raw milk.

Keywords: Milk, processing, productivity, margins.

Gains in productivity which are not associated with technological breakthroughs and major structural changes seldom attract much attention. However, the cumulative effect of steady, pervasive improvement can be dramatic. The performance of the fluid milk processing industry over the past decade is a good example. Analysis of fluid processing margins since 1972 indicates that recent productivity gains have been substantial, though considerably different from those of the 1960's.

The analysis was based on the milk processor costs and margins series published by ERS.[2] These data were available for 1952-61, 1972-81, and partially for 1962-64. Data for 1952 and 1953 generally were not used because of distortions created by the Korean War. The three periods for comparison were 1954-61, 1961-72, and 1972-81. Data were developed from samples felt to be representative of proprietary milk processors; plants owned by grocery chains were not included.

Gross Margins

The gross margin per 100 pounds of raw milk processed rose at the slow annual rate of 1.5 percent during the relatively noninflationary period of 1954-61. The margin in fluid milk processing rose more slowly than that of all food processing and marketing industries—but not by much. Relative to the farm-to-retail spread for all foods, the gross margin declined by 0.6 percent per year. Between 1961 and 1972, substantial automation and productivity growth occurred in fluid processing. The gross margin in 1972 was essentially the same as 11 years earlier, while margins in all food industries had risen at an annual rate of 2.4 percent. On the basis of partial data for 1962-64, the bulk of the gains came during the earlier portion of the period, when the gross margin actually declined.

Inflation has boosted gross margins sharply since 1972. However, the 5.7-percent annual increase was relatively modest. Compared with all food firms, fluid processors' margins declined by 2.9 percent annually, faster even than the 2.5-percent rate of 1961-72. While relative changes in gross margins do not correspond directly to relative productivity growth, it is obvious that productivity of fluid milk processing has increased substantially more than that of other food industries since 1961, and particularly since 1972.

Labor Costs and Capital Investment

During 1954-61, labor costs per cwt rose 2.7 percent annually, significantly more than other costs. The 2-

Table A.—Costs and margins in fluid milk processing, 1954-61, 1962-64, and 1972-81

Year	Gross margin	Salaries, wages, and commissions	Rent, repairs, and depreciation	Other costs	Net margin
			$/cwt[1]		
1954	4.79	2.21	.57	1.57	.44
1955	4.94	2.28	.60	1.62	.44
1956	5.07	2.43	.64	1.61	.39
1957	5.15	2.50	.67	1.60	.38
1958	5.22	2.56	.68	1.60	.38
1959	5.26	2.61	.67	1.59	.39
1960	5.27	2.62	.66	1.58	.41
1961	5.40	2.67	.68	1.62	.43
1962	5.22	2.55	NA	NA	.28
1963	4.96	2.43	NA	NA	.20
1964	4.90	2.43	NA	NA	.19
1972	5.42	2.63	.74	1.88	.17
1973	5.16	2.46	.68	1.75	.27
1974	5.68	2.59	.79	2.02	.28
1975	7.00	2.93	.90	2.44	.73
1976	7.00	3.00	.90	2.50	.60
1977	6.84	2.97	.90	2.60	.37
1978	7.54	3.25	.89	2.75	.65
1979	7.86	3.32	.99	2.98	.57
1980	8.19	3.39	1.00	3.10	.70
1981	8.54	3.66	1.02	3.33	.53

[1]Raw milk processed. NA = Not available.

[1]Agricultural economist, Economic Research Service, USDA, (202) 447-4997.

[2]Lasley, Floyd A., Webster Jones and Leah Sitzman, Milk Dealers' Sales and Costs: A Trend Analysis, 1952-77, ESCS-62, Econ., Stat., Coop. Serv., U.S. Dept. Agr., July 1979; Jones, W. Webster, Milk Processor-Distributors' Sales, Costs, and Margins, 1980-81, AER No. 497, Econ. Res. Serv., U.S. Dept. Agr., Apr. 1983.

percent annual growth in labor productivity was not sufficient to contain rising wage rates. The cost category covering rent, repairs, and depreciation serves as a reasonable proxy for total investment in the longer term, although it is affected by several other important factors in the short run. By this measure, investment per cwt rose by more than 2 percent a year during this period. Much of this rise probably represented the new investment needed to meet the almost 2-percent yearly growth in fluid sales. Even so, the ratio of labor to capital cost rose slowly during 1954-61. Total costs were held down by stable or declining costs in most other input categories.

While the lack of annual data makes it impossible to pinpoint the exact timing, it is clear that fluid processing underwent major changes between 1961 and 1972. The industry underwent a rather classic substitution of capital for labor. Per-unit labor costs declined while costs of rent, repairs, and depreciation rose—although the implied annual rates were less than 1 percent in both cases. The ratio of labor costs to costs of rent, repairs, and depreciation fell from 3.9 to 3.6. Important changes included more automated processing and filling equipment, installation of clean-in-place equipment, automated systems for bulk milk handling, and the demise of glass bottles. With this substitution of capital, labor productivity rose at a strong annual rate of 5 percent. The available partial data indicate that the sharpest declines in labor costs and greatest increases in labor productivity had occurred by 1964. This opportunity for automation was a stimulus for grocery chains to integrate backwards into milk processing. All other costs rose about 1 percent per year during 1961-72.

Productivity gains have remained strong since 1972, despite the increased instability in prices and economic activity. Labor productivity has grown at a 4-percent annual rate, just slightly less than during 1961-72. The important distinction is that these strong gains have been accomplished without significant capital substitution. The ratio of labor costs to investment has shown no trend since 1972. Both per-unit labor costs and per-unit costs of rent, repairs, and depreciation rose at nominal annual rates of 4 percent, far less than the rate of inflation or other costs. These gains in the productivity of both capital and labor arose from a great many technological and management innovations. While no single improvement was particularly dramatic, the cumulative effect has been impressive.

The cost categories that rose most sharply (10 percent a year) during 1972-81 were operating supplies, energy, and (particularly important) containers. Milk processors have relatively little control over these costs. Ironically, the fluid milk industry may have been able to adjust more smoothly and rapidly than most food industries to rapid increases in energy costs because of the great importance of energy to fluid processing. Because milk processors are heavy energy users and must exercise extreme care in heating and cooling to maintain product quality and to meet sanitary regulations, they probably entered the era of escalating energy prices with considerably better-developed expertise in the use, conservation, and recapture of energy than that of most industries.

Net Margins

Net margins generally exhibit more year-to-year variability than do most cost categories. Competitive conditions and the inability to adjust prices quickly in response to changes in raw milk prices or other costs can have substantial temporary effects on net margins. While trends in net margins cannot be estimated with much precision, some general patterns are apparent.

After being relatively favorable during the Korean War, net margins fell in 1954. They slipped further through 1957-58 before moving back to about the 1954 level by 1961. Net margins fell sharply through 1964 and were still at roughly the same level in 1972. Net margins have increased substantially since 1972 but year-to-year variation has been great. In recent years, the net margin accounted for a considerably larger share of the gross margin than a decade earlier.

The ratio of the net margin to costs of rent, repairs, and depreciation provides a general indicator of changes in the return to investment over time. This ratio varied from 0.56 to 0.77 during 1954-61. During most of the 1964-72 period, it probably was around 0.2 to 0.3. The recovery since 1972 returned this ratio to approximately the levels of 1954-61; during 1978-81, it ranged from 0.52 to 0.73.

The low net margins during 1961-72 primarily resulted from structural change. Plants had to automate to remain competitive and they had to grow to automate efficiently. Construction of automated plants by food store chains brought in additional new capacity. With yearly growth in fluid sales slowing to 1 percent, the industry began to have excess capacity and low margins. Additionally, the threat of integration kept margins low, because processors realized that the loss of even one major chain account could threaten their survival. However, periods of very low net margins cannot persist indefinitely. The recovery in margins since 1972 was a normal response to the squeezing out of excess capacity.

These data cannot answer whether or not recent net margins are adequate to replace current capacity as it depreciates. There may still be some excess capacity. Many of the recent innovations have enhanced productivity by increasing the effective capacity of resources already committed to processing, providing a continuing source of excess capacity in a stagnant market. Even so, the data do indicate that the industry's financial health has improved since the 1960's, although (allowing for the sharply higher interest rates of recent years) fluid processing probably is not as profitable as during the 1950's.

Summary

Sustained strong gains in the productivity of both capital and labor in fluid processing since 1972 have benefited milk processors, consumers, and dairy farmers. They have been the major cause of declining real prices for fluid products while simultaneously improving profitability of milk processing. While consumers have enjoyed lower real prices, dairy farmers have been able to sell more milk at any given farm price. If the gross margin

in fluid processing had grown at the same rate as the farm-to-retail spread for all food during 1972-81, the retail price of fluid milk in 1981 would have been more than a tenth higher and almost a billion pounds less milk would have been sold.

It is impossible to predict gains in productivity. Actual gains depend on the rate of technological and management advances as well as on the ability and desire of the industry to adopt them. Predictions based on conditions in either the 1950's or 1960's would have been badly wrong for the following decade. However, it is quite possible that changes during the 1980's will be along the lines of the pervasive, piecemeal improvements of the 1970's, instead of the more revolutionary changes of the 1960's. Whatever the form and pace of technological progress, the evidence of the past two decades strongly suggests that the fluid milk industry will aggressively pursue productivity gains.

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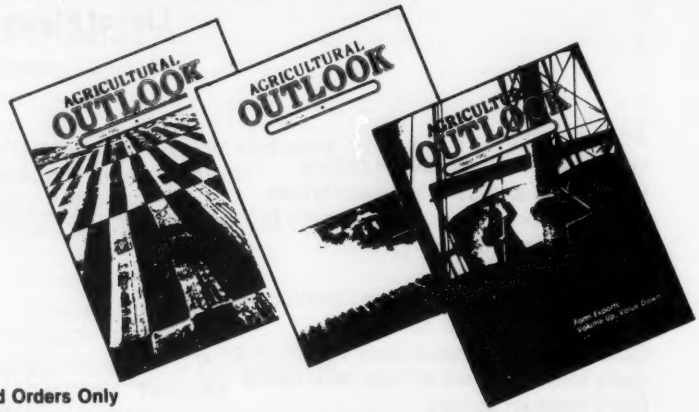

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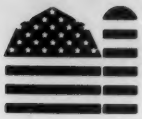

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